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Pacific Marine Review

The National Magazine of Shipping



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JULY
1921



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Pacific Marine Review

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FOREIGN TRADE COUNCIL SPEAKS

Final Declaration of the Eighth National Foreign Trade Convention

THE Eighth National Foreign Trade Convention, composed of upward of 1200 delegates, representing every part of the United States and every factor of our international commerce, met in Cleveland from May 4 to 7, 1921, to study the problems confronting our foreign trade as a result of present world-wide conditions. As a brief statement of the conclusions reached from consideration of the addresses and discussions at its various sessions, it submits its Final Declaration and recommends these opinions and recommendations to the thoughtful attention of the government and the people of the country.

The Situation Today

The world is suffering today from unbalanced exchanges. Notwithstanding the position of the United States as a creditor nation, the present unstable financial condition of a large part of the world, especially of Europe, is the fundamental cause for our own business depression. A return to normal conditions in our own country depends in large part upon an improvement of our foreign trade. The present retrogression is clearly evidenced by the maximum of the country's export trade \$928,000,000 in June, 1919, decreasing in October, 1920, to \$751,000,000, and in March, 1921, to \$384,000,000.

Foreign nations whose imports exceed their exports have been compelled to curtail purchases because of inability to pay by exports. The result of this would be eventual restoration of more normal exchange, but the requirements of international commerce and domestic prosperity in each country demand immediate relief from present stagnation.

The United States must continue to increase its imports of raw material and merchandise not detrimental to existing industry in order to receive pay for the exports necessary to stable employment of labor in agriculture and industry; and to permit of the liquidation of the obligations of the debtor nations. Continued liquidation in gold of foreign obligations to us will tend to renew inflation and arrest the beneficial readjustment of values on the basis required by present conditions throughout the world.

Long Term Credits

It is generally agreed that the solution depends upon our ability to create adequate facilities for the purpose of drawing upon surplus American investment funds in order that the long term credits so badly needed by the disorganized countries of Europe may be furnished. Most of the countries of Europe are unable to pay us now and for some time to come in gold or merchandise; and unless they are enabled to obtain credits to purchase the raw materials which they need, their business and ours will continue to stagnate.

We urge the immediate creation of financial insti-

tutions under the Edge law, whose machinery will facilitate extension of long term credits to promote free exchange of exports and imports. We commend efforts to acquaint our investing public with the necessity of purchasing debentures issued by such institutions against approved foreign securities for this purpose, so that eventually every community will serve its own vital interest in furthering our foreign commerce as a necessary component of domestic prosperity.

The reduction of loans and accumulation of banking reserves now permit, and the lower prices of many commodities justify the extension of credits sufficient to accelerate recovery in certain lines. This should gradually thaw frozen credits and end stagnation. It will further provide increasing export and import cargoes for our now practically idle merchant marine and contribute to restoration of economic equilibrium in countries suffering from war debts and inflated currencies and to a proper distribution of commerce in neutral markets.

Restoration of Normal Conditions

The increased confidence prevailing in the American business world denotes the disappearance of danger of financial panic. As liquidations progress and reconstruction in Europe proceeds, normal conditions will be restored. Nevertheless, after so great a disturbance in business and financial conditions, it is prudent to recognize that equilibrium will be restored and commerce resumed only by gradual process. Months may elapse before necessary liquidation will have been accomplished. It will continue to be the part of prudent commercial and financial interests to refrain from hasty and ill-advised expansion tending through renewed inflation to nullify quickly the present fruitful efforts of conservative business men to lead the country back into paths of safety and sanity.

It is manifest that while many products of our soil have been reduced in value to pre-war levels, a number of manufactured products remain too high in cost of production to compete in neutral markets with foreign goods. It is essential that the substantial reduction in cost of living, which has already occurred in food products and other basic commodities, shall be followed by economies in cost of production until a stable balance of values of all commodities and productive effort is established. No readjustment, however, can be complete without reduction of costs of railroad transportation both for domestic and export shipment. Continuance of our present cost of finished merchandise would maintain unreasonable expense of living and put our products in a non-competitive position in markets of depleted purchasing power.

American Maritime Policy

Congress has declared in favor of private owner-

ship of our merchant marine as soon as practicable, but under present conditions it is impracticable to dispose of any considerable proportion of our merchant marine to private owners at fair prices.

So much of the fleet as can not be chartered on a bare boat basis or time charter to private operators, should be laid up pending the revival of world commerce; meanwhile the fleet will serve our national security as a naval auxiliary, in case of necessity.

The plan should be abandoned of allocating ships to load at ports and for trade routes irrespective of the tonnage of cargo offering or of the losses to the government attendant on this policy.

While it is obvious that the ultimate sale price will be measured by the world market for similar ships, such parity of price and successful operation can be obtained only if the operating costs are approximately equal to those of our foreign competitors.

Present shipping laws requiring larger crews subject American vessels to a disadvantage estimated at 5 per cent on the capital investment, while the compulsory advance of half wages in any foreign port of call adds a further burden of cost by involving excessive delays.

As continued maintenance of the American merchant marine is of vital interest to American producers, exporters and importers, they should require the employment of American vessels in the carrying of their shipment of exports and imports to such extent as they are able to exercise preference or control, and in any case they should prevent discrimination against American ships in such transportation.

It is believed that the adoption of these recommendations will save the government its present large loss in carrying on the existing plan of operation and will insure ultimately the retirement of the government from the shipping business through the sale to private owners of the fleet at reasonable prices.

Between the United States and its possessions and foreign ports, rapid, regular combined passenger and freight service should be maintained for the prompt and regular carriage of the mails, express, freight and merchandise.

Marine Insurance

The State and Federal governments are urged to remove those disabilities caused by non-uniformity of state laws and excessive taxation which place American insurance at a disadvantage with the foreign insurance market in which they must compete. We urge the enactment of the marine insurance measure now pending in Congress, a model upon which uniform state legislation may be based.

Burdensome Taxation

Excessive governmental expenditure in all countries imposes upon the commerce of the world a burden, the further increase of which can end only in disaster. Provision of facilities for commerce is futile if every business activity continues to be oppressed by a multiplication of taxes. For the recovery of normal prosperity the utmost economy in governmental expenditures should be accompanied by unrelenting frugality in private business.

Arbitration and Standardization

Throughout the world the stress of readjustment has been attended by deplorable violations of the sanctity of contracts, emphasizing the absence of adequate international machinery for the enforcement of awards of commercial arbitration. This deficiency should be promptly remedied. In many instances all parties affected by breaches of contracts sincerely believe themselves in the right, as numerous commodities in

foreign trade are not standardized. Standardization of grain, cotton, iron ore and other staple trades has protected them from the defaults so numerous with merchandise to which standardization should, so far as practicable, be applied. Business interests should co-operate with the United States government to this end.

Through the initiative of the National Foreign Trade Council standard definitions of shipping terms (F.O.B., C.I.F., etc.) in foreign trade have been generally adopted in the United States. The concurrence therein of commercial organizations abroad should be sought by the Council. Revision and uniformity of ocean bills of lading are greatly to be desired now that the hazards of war are removed.

We commend the efforts of the American Bankers' Association and other organizations to adopt uniform standards of Letters of Credit.

Persistent Effort Essential

American export business has been injured in the past by lack of persistent effort to hold markets already gained. American producers are urged not to abandon or lose interest in their foreign trade because it shows no profit for the moment and to remember that in many cases it will cost much more to regain in the future a business lost now through lack of courage and foresight.

The Bargaining Tariff

The vast market which the United States offers to other nations on a basis of equality, and the supplies of American raw material exported without taxation or discrimination, entitle the American export and import trade to equality of treatment in all foreign markets.

To insure such equality of treatment, the American tariff, whatever its underlying principle, should provide for additional duties on imports from nations discriminating, by tariffs or administrative practices, against the trade of the United States.

Development of Government Service

The Foreign Service of the United States should be reorganized and established under a unified supervision which will promote its efficiency, both in diplomatic representation and in the collection and dissemination of commercial information. This reorganization should provide for a permanent career through the establishment of a national training academy for the foreign service, which will attract competent and ambitious young men into a life work of constructive effort in their country's service.

Foreign Trade Education

Scientific educational training is as essential for our business agents as for our official representatives. It should equip them with accurate and practical knowledge of foreign markets and languages, as well as of the economic, social and political conditions prevailing in other lands. The exchange of scholarships, already established with several countries, is a most helpful means to this end, and should be widely encouraged.

Necessary Legislation

The convention urges upon Congress the vital importance of prompt action upon measures affecting our foreign trade now pending before it. Chief among those calling for immediate enactment are the increases of appropriation that will provide for much needed expansion and improvement in the Bureau of Foreign and Domestic Commerce and in the Bureau of Standards in the Department of Commerce.

We urge the earliest possible enactment of the China Trade Act, which will permit the formation of

American companies to trade in China on a plane of tax equality with their competitors of other nationalities.

We submit that the policy of taxing Americans abroad upon income derived from within the country of residence is fundamentally uneconomic, is really restrictive rather than productive of revenue, and is a handicap upon the promotion of American enterprise abroad and bound to react disadvantageously upon industry at home. The United States is the only great commercial nation which pursues this policy, and we urge Congress to abandon it in the forthcoming revision of the revenue laws.

The steady maintenance of a prosperous foreign trade is as vital to the successful operation of government as to the welfare and contentment of all our people, and we submit that the time has come when the two houses of Congress may well consider the establishment of separate standing committees on foreign commerce as a means of insuring more prompt and effective handling of measures affecting foreign trade.

Increased Mail Service Desired

We commend the improvement of foreign postal communications and the extension of international parcel post service recently accomplished; and urge upon Congress the revision of the revenue law necessary to permit the negotiation of a parcel post convention with Cuba, so that our manufacturers and exporters may be enabled to enjoy the same means of access to that market now available to their European competitors.

It is essential to the best development of the trade and commerce, both domestic and foreign, of the United States, and for defensive purposes in time of need, that our national waterways should be developed adequately and fully utilized.

Use of Foreign News by Our Press

The popularization of overseas trade by those news and trade publications and press associations which have given valuable space and journalistic skill to the gathering and dissemination of accurate foreign news is recognized and appreciated. In certain sections of the country the supply of foreign news is inadequate for the needs of their industries, and this condition retards public understanding of foreign trade policy, and of the true relation of foreign trade to the welfare and prosperity of our people.

International Communications

Expansion of the systems of international telegraphic communication, under American control and operation, is essential to proper development of our foreign trade.

In the international conventions necessary to establish equal opportunity of all nations in the development of their communications, we urge the importance of separate treatment of the two chief methods of communications on radio and cable.

Mandates

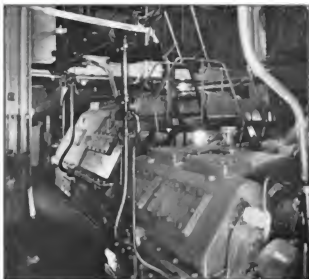
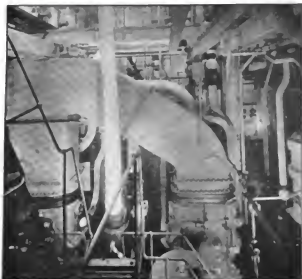
This convention, representing every section of the United States, and without regard to politics, approves the policy of the State Department regarding mandates as expressed in its recent notes to the principal powers, and pledge thereto our full support.

SEAMEN'S WAGES ON BRITISH AND FOREIGN VESSELS, 1920.

	Chief Officer.	2nd Officer.	3rd Officer.	4th Officer.	Carpenter.	Boatman.	Quartermaster.	A.B. Sailor.	O.S.	Chief Engineer.	2nd Engineer.	3rd Engineer.	4th Engineer.	5th Engineer.	6th Engineer.	Stokeholder and Cookman.	Granger.	Fireman.	Tinsmith.	Waldman.	*Increase in cost of living, September, 1920, over July, 1914.																	
	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	£	s	d	Per cent.																
British cargo steamer, 7,500 tons gross	29	0	24	3	5	0	—	—	—	17	0	16	0	15	0	14	10	9	3	35	0	29	0	24	3	5	0	—	—	—	—	—	—	—	—	—	—	170
French steamer, 7,000 tons gross, 26-40 passengers	16	19	14	12	12	1	—	—	—	7	6	7	11	—	—	6	11	5	9	33	2	21	12	16	7	43	2	—	—	—	—	—	—	—	—	—	—	300
Spanish cargo steamer, 7,000 tons gross	29	4	21	18	—	—	—	—	—	8	4	9	3	—	—	5	10	5	2	54	16	29	4	21	19	18	5	—	—	—	—	—	—	—	—	—	100 (?)	
Italian cargo steamers, 4,000 to 8,000 tons gross	39	19	30	0	—	—	—	—	—	11	5	12	10	—	—	7	10	7	0	74	29	19	30	0	25	0	—	—	—	—	—	—	—	—	—	—	290?	
Dutch cargo steamer, 7,000 tons gross	45	12	37	14	32	15	—	—	—	24	8	23	0	20	0	15	15	—	—	59	10	45	12	37	14	32	15	—	—	—	—	—	—	—	—	—	117	
German cargo steamer, 7,000 tons gross	5	10	4	18	4	—	—	—	—	3	19	3	4	3	3	3	2	18	1	1	6	9	5	10	4	18	4	6	3	3	—	—	—	—	—	—	1,000-1,500 (?)	
American single-screw, 11,000 d.w.	62	17	54	19	48	8	—	—	—	27	9	26	2	—	—	23	7	17	17	91	7	62	17	54	19	48	8	27	9	—	—	—	—	—	—	—	99	
Norwegian cargo steamer, 7,000 tons gross (?)	27	15	23	6	19	2	—	—	—	15	12	14	19	—	—	13	14	8	13	30	7	23	15	20	10	—	—	—	—	—	—	—	—	—	—	236		
Portuguese cargo steamer, 3,500 tons gross	9	18	7	8	5	19	—	—	—	—	3	12	—	—	—	2	12	—	—	14	6	5	18	6	18	6	3	—	—	—	—	—	—	—	—	—	—	
Belgian cargo steamer, 7,000 tons gross	12	10	10	14	8	19	—	—	—	8	9	7	12	7	3	6	14	6	9	3	16	17	8	13	8	10	6	18	8	9	—	—	—	—	—	—	300 (?)	

NOTE.—The figures in black type are British equivalents at rates current (December 31, 1920). The figures in ordinary type are British equivalents at par rates of exchange.
 * Supreme Economic Council Monthly Bulletin of Statistics.
 † Mean of Rome and Milan.

The above interesting and comprehensive table is a reproduction from our British contemporary, Shipbuilding and Shipping Record. It was compiled by British shipowners to show the necessity for a general reduction in wages on British ships and is intensely interesting to American shipowners and maritime workers as showing the tremendous discrepancy between American wages at sea and those paid on board the ships of our competitors. Incidentally, it is to be noted that since the compilation of this table all of the classes of British workmen represented thereon have accepted a cut averaging about twelve and one-half per cent.



Two views in the engine room of the Matson Navigation Company's new freighter Manulani, showing the Westinghouse divided-flow turbines and Westinghouse double reduction gear



The Manulani at the San Francisco dock of the Matson Navigation Company just in from her first round trip to Honolulu



The boiler room of the Manulani showing furnace fronts fitted for oil burning

EXPRESS FREIGHTERS

The Manulani, 14,000-ton Carrier of Matson Navigation Company, Completes First Voyage

IN Pacific Marine Review for May, 1920, we published a description of two vessels to be built for the Matson Navigation Company for the Hawaiian sugar trade. As we stated at that time, the prime consideration facing the naval architect of the Matson Navigation Company was the maintenance of schedule and of turn-around of these ships at each end of the run.

The vessels were built at the Moore Shipbuilding Company, and the Manulani, the first of the two, was delivered and has completed her maiden trip to the Hawaiian Islands. The second vessel, the Manukai, is at the present writing just completing her builders' trials.

The principal dimensions of these vessels were: length over all 497 feet, length between perpendiculars 480 feet, molded beam 62 feet, with a deadweight tonnage of 14,000 tons on a 30-foot draft. The machinery for driving these hulls was manufactured by the Westinghouse Manufacturing Company and consists of a divided-flow Westinghouse-Parsons turbine of 5500 S. H. P. running at 3500 R. P. M. connected to the propeller shaft through Westinghouse double reduction gear so as to drive the 4-blade propeller at 95 R. P. M. The ships were to have a speed of 12½ knots on their loaded draft.

The Manulani on her trial easily exceeded the contract speed and, as will be seen from figures given later, had no difficulty in maintaining or exceeding that speed at sea. Steam for the Manulani's turbines is provided by Scotch marine boilers fitted with Foster superheaters for 50 degrees superheat.

The table herewith shows an abstract of the engineer's log on the round trip from San Francisco to Honolulu. It will be noted that the consumption of fuel, which includes all of the fuel for auxiliaries, is less than 1 pound per S. H. P. hour, both going south when the ship was comparatively light and going north when she was fully loaded and bucking head winds all the way. This is a very good record for fuel economy for a turbine installation of this size, and the low slip percentage of the propeller shows that the designing of that important adjunct to the power plant has been very well taken care of.

The cargo on the Manulani on the way home was approximately 13,000 tons—certainly not less than that amount—so on that leg of the trip she logged 27,040,000 ton miles on a fuel consumption of 2705 barrels, or roughly 10,000 ton miles per barrel, or 238 ton miles per gallon, which for a steamer of this size and class is doing exceedingly well.

The machinery on the Manulani worked perfectly for the round trip. Apparently the Westinghouse Manufacturing Company has succeeded in perfecting its methods of manufacturing marine reduction gears, for upon examination it was found that the tooth faces of all of the pinions and gears in the sets on



Stern view of the Manulani on her trial trip

this vessel were in perfect shape, showing the original tooth marks unaltered, although they must have withstood a terrific amount of stress and shock on the voyage north. In discharging cargo the deck machinery of the Manulani functioned perfectly, and on the bunkering of the ship at San Francisco on the return voyage it had certainly an opportunity to show the stuff of which it was made.

The Manulani brought north 184,000 bags of sugar, 50,000 case of pineapple, 1800 bunches of bananas, and 1100 tons of miscellaneous cargo. In delivering the sugar at Crockett the high average of 1550 bags per hatch per hour was maintained, some of the hatches reaching a rate as high as 1800 per hour. The three hatches worked at Crockett discharged 37,200 bags of sugar per day of eight hours. In working at this rate the fuel consumption for auxiliary power amounted to 75 barrels of oil per day.

The two tables printed herewith are compiled from an abstract of the engineer's log during the first trip of the Manulani. Marine engineers will note with interest the very good fuel economy and the slip percentages indicating careful design of the propeller. The chief engineer confidently expects to better these records during the next few trips of the vessel, no effort having been made on this first trip to achieve a record.

MANULANI ENGINEER'S LOG - FIRST TRIP HOMEWARD

Day	Distance	Time	Knots per Hr.	R.P.M.
1	223.0	10 hr. 46 m.	11.9	93.9
2	294.0	23 " 34 "	12.4	95.7
3	301.0	23 " 33 "	12.7	96.3
4	302.0	23 " 32 "	12.76	95.7
5	296.6	23 " 32 "	12.5	95.5
6	286.0	23 " 31 "	12.0	94.9
7	278.0	23 " 32 "	11.9	95.1
8	100.0	8 " 30 "	11.0	95.3
Total time 7 days 1 hr. 37 m.				Total fuel consumption 2705 bbl.
Distance ship 2090.0 knots				Consumption per hour 16.2 "
" " screw 237.3 "				" " " 237 "
Av. speed ship 12.26 "				Miles per barrel oil .968 lbs.
" " screw 13.8 "				Fuel 17° Baumé .74
Slip 11½ %				Draft 26' 1" forward 36' 2" aft
Main engine S.H.P. 5500				
Auxiliary " 800				
Total " 6300				

MANULANI ENGINEER'S LOG - FIRST TRIP OUTBOUND

Day	Distance	Time	Knots per Hr.	R.P.M.
1	221.0	17 hr. 25 m.	12.67	95.5
2	318.5	24 " 18 "	12.90	94.5
3	320.0	24 " 21 "	13.10	95.0
4	336.0	24 " 23 "	13.56	96.0
5	334.0	24 " 22 "	13.67	96.0
6	318.0	24 " 23 "	13.11	94.5
7	236.0	16 " 2 "	13.10	93.0
Total time 6 days, 13 hr. 22 m.				Total fuel consumption 2204.94 bbl.
Distance ship 2090 knots				Consumption per hour 16.5 "
" " screw 215.5 "				" " " 215.5 "
Average speed ship 12.22 knots				Miles per barrel oil 1.1
" " screw 13.63 "				Fuel 17° Baumé
Slip 2.6%				Draft 13' 6" fwd. 21' 6" aft.
Main engine S.H.P. 4900				
Auxiliary " 490				
Total " 5390				

COLLOIDAL FUEL

COLLOIDAL fuel is a stable liquid mixture of pulverized coal or coke suspended in mineral oil or blended oil and tar. It is atomized and burned as a liquid fuel, using the ordinary pre-heat of fuel-oil. To prevent sedimentation when storage for a period of time is contemplated, a stabilizing treatment is given. This consists in the use of one or more measures. Thus saponification affords protective action. (1) It may be applied by adding, for example, a lime-rosin soap to the mineral oil, thereby fixating it. About one per cent of rosin, or 20 pounds per ton of fuel, and half a per cent of lime, or ten pounds, are used. (2) Or by adding an alkali which saponifies with the rosinous content in the ingredients of the fuel. Some coals and oil contain sufficient saponifiable matter for stabilization in certain cases. A fraction of one per cent of alkali is sufficient in certain cases. The residue of calcium gives the more persistent stability. (3) Stability is also promoted by digesting the coal in fuel oil with by-product-oven tar or water-gas tar and heat at about 180 degrees Fahrenheit for a short period.

The process is broadly covered by basic patent protection in the United States and in practically every foreign country. The combined process of colloidalizing and of removing ash from coal by fresh floatation is also covered.

Principal Advantages of Colloidal Fuel

By combining coal or coke, and tar if desired in limited amounts, with mineral oil, the available quantity of oil may be used to yield a considerably larger amount of liquid fuel. Colloidal fuel carries up to 45 per cent of coal or coke in liquid form and up to 55 per cent in a mobile form suitable for locomotives. It is manifest, therefore, that the amount of liquid fuel available with a given quantity of fuel-oil may be greatly increased.

The heat units in colloidal fuel are as efficient as those in oil and sometimes more so. The reason why in some cases there is greater efficiency may be attributed (a) to the explosion of the solid particles when the absorbed liquid vaporizes in the combustion chamber, thereby increasing the area for oxidation beyond the surface of atomized droplets, and (b) to less flue gas loss than with oil inasmuch as the hydrogen contact with the coal in the mixed fuel is less than that of straight oil.

Since in most localities the heat units in coal or coke are much lower in cost than the heat units in oil, the cost of heat units in the mixture will be lower than that of oil, until the cost of oil falls to so low a point that the cost of manufacture balances the

Almost since the beginning of the commercial use of fuel oil attempts have been made with indifferent success to produce a commercial fuel from a combination of coal and oil. During the fall of 1917 the unrestricted submarine warfare of the Huns caused the Submarine Defense Association to concentrate its attention on conservation of oil fuel, with the result that coal and oil mixtures or colloidal fuel again came to the front.

Mr. Lindon W. Bates, a member of that association, suggested to Mr. George Eastman of Kodak fame that part of the laboratory staff of the Eastman Kodak Company be designated to assist in an investigation of the possibilities of producing a stable mixture of coal and oil. The result was that after considerable experimental work a new fuel series was developed ranging from a free flowing fluid containing 30 per cent of powdered coal, 69 per cent of oil and 1 per cent of fixturer up to mobile mixtures containing as high as 55 to 60 per cent of coal.

The article here printed is compiled from interviews with and printed material submitted by Lindon W. Bates, who now controls the basic patents covering this process and who was recently in San Francisco interesting Western railroads in the use of the new fuel.

economy. This will be when oil costs about 2 cents a gallon. For this reason colloidal fuel can compete almost everywhere with oil. It can compete with coal wherever oil can do so, and sometimes where oil cannot. The cost of manufacture is about from \$1 to \$1.50 a ton.

Since the specific gravity of colloidal fuel is greater than that of water, a conflagration can be extinguished with ordinary fire appliances. It is also possible to fireproof the fuel in storage by a layer of water on the top surface of the fuel. This means that colloidal fuel can enter cities, while for fire reasons oil cannot without risk or special precautions. In this connection, attention is called to the favorable report and rating given to the fuel by the Fire Council of the National Board of Fire Underwriters. There is therefore a wider market for colloidal fuel than for oil.

Owing also to the higher specific gravity of colloidal fuel than oil, the mixed fuel in which a good grade of coal or coke is used possesses greater heat value per unit volume than oil, although possessing less per unit weight. Like oil, it possesses, of course, much greater heat value per unit volume or per unit weight than coal. Fewer barrels or cars of colloidal fuel are required therefore to give the same amount of heat units as oil. Liquid fuel should logically be sold on a B. T. U. basis. There are usually more B. T. U. in a barrel of colloidal fuel than in a barrel of oil. Where storage is of importance, as it is on ships and locomotives and in houses, this greater "heat density" is of special advantage.

Small Colloidalizing Plant

The plant necessary for the colloidalization of oil fuels is comparatively simple and inexpensive. It is estimated that a plant with capacity to handle 2500 pounds of coal an hour would cost from \$35,000 to

Fuel	B. T. U. per lb.	Calor. Unit per Ton	B. T. U. per Gallon	Specific Heat Density
Colloidal Fuel	14,475	33.3	1,112,272	100.0
Topple-Monroe Oil	15,439	27.1	1,196,200	99.2
Anglo-Persian Oil	18,902	40.3	1,555,000	94.6
Paraffin	19,788	44.2	999,736	99.6
Petrol	19,982	43.6	970,343	78.1
Scottish Coal	13,860	40.2	669,099	69.0
Newcastle Coal	14,300	47.8	645,000	57.8
Welsh Coal	13,900	38.8	612,000	55.1
Pulverized Scottish Coal	15,000	36.0	600,000	53.8
Acetylene Gas	21,450	32.00	1,302	0.0013
Calorized Water Gas	12,848	41.50	650	0.0006
Hydrogen	61,300	41.50	323	0.0003
Producer Gas	1,929	22.50	124	0.0001

Table showing the heat density of various fuels

\$40,000 and one with double that capacity about \$55,000.

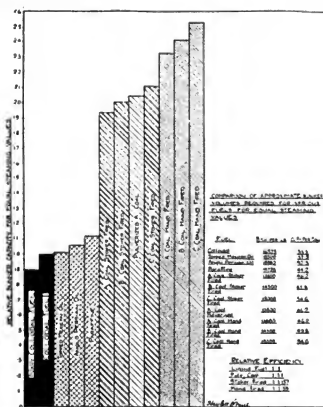
The flow of the material is as follows: Coal or coke is delivered to a rotary crusher, set to crush to $\frac{3}{4}$ inch, which discharges to a rotary screen perforated with $3/16 \times \frac{1}{2}$ inch slots. The oversize is returned to the crusher by conveyor for regrounding, and the material passing the screen is carried by bucket elevator to overhead storage bins. From storage the coal or coke (or both) is delivered to a Trump calibrating device which delivers a predetermined quantity continuously to a steam jacketed conveyor box or pug mill which constitutes the receiver and mixer of the tube mill feed. Oil, tar and fixturer, constituting the liquid elements to be used, are brought in separate lines to a special measuring device in which the liquids are kept at a constant level, with overflow returning to storage. From this device the liquids are delivered to a common discharge line and are pumped through a heater to discharge into the pug mill mentioned above. The liquid and dry elements, combined in the pug mill, are fed to the tube mill, the discharge from which flows by gravity to digesting tanks. From the digesting tanks the finished product is pumped to storage.

As laid out, the measuring devices and pug mill are driven from a common line shaft, so that the speed of feed to the tube mill may be varied at mill without disturbing the ratio of solid or liquid feed. The various ratios between coal, coke, oil, tar, etc., necessary for making different grades and types of fuels, can be effected by changing the initial settings of the measuring devices.

A separate drive unit includes the rotary crusher, screen conveyor and elevator. This unit is designed to have a capacity in excess of that of the tube mill, so that continuous operation will not be necessary.

The tube mill is driven as a separate unit, and the pump drives may be either by belt or individual unit drive, as local conditions may dictate.

The problem of the manufacture of colloidal fuels and their application in the industries and in transportation is one of intense interest to the Pacific Coast at this time, not only on account of the possible conserving of Pacific Coast fuel oil supplies by the application of colloidal mixtures, but also on account of the incidental and necessary additional uses for much of our merchant marine tonnage which will be brought



Graph showing the relative volume required by various fuels for equal steaming value

about by any very wide application of this new idea. The bulk of the oil supplies on the Pacific slope is in fields located either in California or at coastal points south of California; the bulk of the low grade coal deposits on the Pacific Coast lies in our northwestern states, British Columbia and Alaska. It would, therefore, be apparent that any very extended use of colloidal fuels on this coast would involve the establishment of large colloidalizing plants at prominent ports in California and south and also at Puget Sound ports and north, oil from California fields being carried north by steamers supplying such plants and coal from the northern deposits being carried south, thus establishing a new permanent and profitable use for a large amount of merchant tonnage.

Example	Paraffin Base Oil	Aromatic Base Oil	Pressure Still Oil	Wax Tailings	Coal Tar	Middle Fraction Coal Oils	Residue	Aromatic Coal (25 $\frac{38}{100}$ ash)	Bituminous Coal	Coke	Fuel Specific Gravity	Fuel Flash-point (Open Cup)	Fuel B.T.U. (per lb.)	Viscosity (Degrees Engler), 70-100° F.	Settable Product	Stability (Minimum at 70° F.)
A	70 %	—	—	—	—	—	—	—	30 %	—	1.03	240° F.	17,100	170° E.	150° F.	3 months
B	—	35 %	—	20 %	10 %	—	—	—	35 %	—	1.12	250° F. $\pm$	17,000	350° E.	160° F.	3 months
C	10 %	—	37 %	3 %	—	—	10 %	—	1.15	300° F. +	15,300	200° F.	150° F.	10 days		
D	10 %	30 %	30 %	—	—	—	—	—	30 %	—	1.08	266° F.	17,200	67° E.	150° F.	4 months
E	8 %	—	50 %	—	10 %	2 %	—	—	30 %	—	1.04	262° F.	16,650	432° E.	180° F.	4 months
F	—	60 %	4 %	—	—	—	—	—	18 %	18 %	1.05	273° F.	16,900	—	180° F.	6 months
G	—	34 %	4 %	—	—	—	—	—	21 %	21 %	1.08	250° F.	16,700	—	180° F.	8 months

Table showing the composition and characteristics of colloidal fuel of various grades. Percentages of components are given only in round numbers

In the establishment of such colloidalizing plants it has been found entirely feasible and practicable to effect economies through a system by which crude petroleum is fed to the colloidalizing mill instead of fuel oil. The mill in ordinary running, as a result of grinding friction, maintains a temperature of about 190 degrees Fahrenheit. This by a speeding up of the mill and by proper controlling equipment could be raised to an appropriate point for the driving off of the gasoline and distillate fractions, and the mill could thus become a continuous still with three products, gasoline, distillates, and colloidal fuel. It can very readily be figured that in a colloidalizing plant of suitable capacity for ordinary railroad work the gasoline and distillate by-products of such a process

would more than pay for the cost of colloidalization.

The possibilities involved in the manufacture and use of coal and oil mixtures are almost boundless. The use of these mixtures immediately increases the available fuel oil supply by from 35 to 50 per cent, at the same time producing a fuel which gives an equivalent B. T. U. content at a cost of from 15 to 25 per cent less as compared with fuel oil.

Some experiments that have been carried out would indicate the possibility of the practical use of this new fuel in Diesel engines, and certainly there is sufficient practical application of these mixtures to represent an aggregate annual saving running into the hundreds of millions of dollars.

LONG TIME CREDITS

Their Value To The Exporting Manufacturer

By GEORGE R. MEYER^{ORD}
President, Illinois Manufacturers' Association

THE Chicago newspapers carried an article a few weeks ago that was startling to me. The article stated that not one single incorporated bank in the state of Illinois had failed in the year 1920.

When I contrasted this announcement with the tremendous mortality among the manufacturers of Illinois and the nation, it brought forcibly home to me one thought—namely, that Uncle Sam did a good job in the Federal Reserve system, in making it almost impossible for an honest banker to go bankrupt through frozen inventories. This situation of frozen inventories with the manufacturer has taken thousands of plants and put them into the hands of creditors' committees or into the hands of the courts.

As I view the Edge Law foreign trade financing machinery, it offers the first step whereby the manufacturer gets some reasonable measure of relief towards creating that highly desirable, stabilized situation whereby his frozen inventory is rendered more liquid. In other words, the only relief at the present moment for the manufacturer is to sacrifice at a frightful cut-throat price such excess inventory as he possesses at the time of a collapse in business.

Inventory

Let me carry you into the manufacturer's problem on inventory. I will recite the inventory facts of a typical manufacturing plant. This plant produces automobile accessories material. It buys its raw products—largely lumber—from the South and the Pacific Coast. On account of railroad congestion, its freight cars during 1920 averaged fifty-two days rolling. In other words, fifty-two days of inventory of raw materials was on the road to their plant. Many cars took eighty days to arrive. The fastest delivery was twenty-two days. It was necessary for this plant to figure sixty days' worth of inventory as impossible of stoppage of delivery should business depression set in. Any plant of this description of necessity had to figure forty or fifty days' supplies on hand. The complete shut-down of the auto industry in August last year created an almost impossible situation for this plant. Needless to say that this is typical of thousands of similar cases. This company had immediately maturing thirty-day obligations of such large

volume that it could not possibly grant long time credits for its export business; in fact, where it had been granting ninety days, it now had to demand cash to realize; it instantly found itself under the necessity of curtailing its terms for export business, which acted as an immediate choke against liquidation itself. Had the Foreign Trade Financing Corporation been in operative existence, this firm could have liquidated considerable of its inventory on a long time credit basis and the bankers would have been more safeguarded; the write-off on inventory would have been smaller, as the frozen inventory would thus have been relieved. It must be apparent to any one that this firm was utterly unable to allow the lumber mill to make further deliveries against future contracts that it had placed. Surely, the mill without export trade supplying this manufacturer would be vitally interested in the Foreign Trade Financing Corporation, as its machinery would furnish relief to its customers who had export trade and who thus would have provided his mill with orders. It certainly would have stabilized his condition.

History to be Repeated

History will repeat itself in Europe. Countries now struggling bravely to regain their pre-war standing have lost little in natural resources or industrial competency. All they need is time—a little time—to recover. They are solvent. They furnish the most inviting field in the world for foreign trade, for they are in need of American goods. Their supply of machinery for production, agricultural implements, transportation equipment, tools, hardware, electrical supplies and innumerable commodities that can be supplied by our manufacturers, is exhausted or very low. They need above all the raw material or the partly manufactured stocks which can be furnished by this country, and which can fast be turned into money by the industrious millions of war-sick Europeans.

Our manufacturers, our mines and our farmers are willing and anxious to supply European needs. They expanded during the war, and overseas trade is essential to their enlarged capacities. But as they cannot always operate their plants on future promises to pay, no matter how dependable those promises are, they must have behind them some financial organization that temporarily will supply this money while the rich European trade is being garnered.

* Paper delivered at the Eighth National Foreign Trade Convention, Cleveland, Ohio, May 4-5-6-7.

Every day American manufacturers are being offered profitable European business that they reluctantly are obliged to decline because this country has lacked the foreign trade financial machinery that has been developed so successfully by Great Britain. Here is a typical example:

Typical Example

A flour miller receives an inquiry from Czechoslovakia for one-half million dollars' worth of flour. The Czechoslovakian government wants six months' credit. The inquiry comes from the flour millers through the government. The government to get credit for its flour dealers offers to put up a lot of beet sugar margined down below the market value, plus its own bonds and plus the credit standing of the flour dealers.

All this collateral and moral responsibility should make the transaction good. Certainly it is legitimate.

At first blush the average person would say, "Why doesn't the Czechoslovakian government sell the sugar?" The answer, of course, is perfectly simple. Supposing the entire corn crop of Illinois was dumped on the market at one time, six months too soon. It is obvious that the sugar would be unsalable. Time must be given to liquidate the sugar, and for that purpose time must be given in which to pay for the flour.

Another flour deal tendered offers some other home commodity of which the country has a surplus. For instance, Roumania would have oil; Bulgaria, wool; Yugoslavia made a tender for a lot of flour, offering to margin down copper that she had. She wanted six or nine months' credit in which to make the turn and so as not to sacrifice her copper. She offered bank endorsements, government bonds, plus the copper margined down.

Nine Months' Credit Wanted

A case that has come to my notice within the past few weeks is that of a manufacturer of high tension electrical apparatus who had an offer of an order for several hundred thousand dollars' worth of his goods, provided he would give six to nine months' credit. The buyer was a Scandinavian municipality and the security, besides the city bonds, was the tax warrants due six to nine months later, and the amount of the tax warrants offered was many times in excess of the amount of the purchase.

Another Scandinavian transaction was that of a large pulp and paper company or timber company who wanted to buy logging machinery—upwards of one-half million dollars' worth. The high credit risk in this case was supplemented by the willingness to store enough of its manufactured product to guarantee ample security.

Instances of this nature are legion and merely illustrate the daily tenders that are coming along.

A Balkan Tender

Let me illustrate a composite of such transactions in the form of group purchases tendered through the Honorable Charles J. Vopicka, the American minister to the Balkan countries:

February 22, 1921.

Mr. George R. Meyer, President,
c/o Illinois Manufacturers' Association,
76 West Monroe Street,
Chicago, Illinois.

Dear Mr. Meyer:

In answer to your letter of February 16, I beg to make the following statement regarding the necessity of the organization which is to be known as the Foreign Trade Financing Corporation of New York.

America has a better opportunity at the present time to do business with Europe and other parts of the world on account of the conditions which the world's war brought about.

It is impossible to do business for cash money with Europe because our dollar is too valuable in comparison with their money.

America can remedy these conditions without any sacrifice. These countries need credit for the time being. They do not require any cash money from America, but they do want raw material and finished products of our factories.

The United States government during the war advanced money to these countries, for the purpose to be able to help us in the war, but now that the war is over our government does not wish to continue to make loans, and therefore it depends on the individual American banker, business man and manufacturer to give credit to these countries. There is no doubt that these countries, after a few years, will be able to pay their indebtedness in full.

I have received orders from Roumania, Bulgaria, Yugoslavia and Czechoslovakia, amounting to over twenty million dollars, consisting of fifteen different varieties of merchandise, which could keep many factories busy if it would be possible to obtain credit from the banking institutions at the present time, but owing to their banking rules and different laws, it is impossible to obtain these loans from them.

Therefore, it is necessary that this new financing corporation be supported by all business men and manufacturers, and I most emphatically recommend subscriptions to the stock of this new Foreign Trade Financing Corporation of New York, through which body manufacturers and business men can afford to give credit. But in this connection I beg to call your attention to one point, which must be made clear, that this new corporation is to aid all the firms in the export business, not only one or two large corporations; I mean to say that all the exporters from all parts of America should get benefit from this new corporation.

I am sorry not to be able to be present at your meeting on account of my needed presence in Washington, but I shall take up the matter of subscriptions with you as soon as I return to the city.

Hoping that the manufacturers will see it with the same eye as I do, I am,

Sincerely yours,

(Signed) CHARLES J. VOPICKA.

Mr. Vopicka's list of orders mentioned in his letter includes the following:

Railroad equipment	Rosin
Condensed milk	Cotton
Leather	Agricultural machinery,
Tin-plate	which includes about
Paper	nine different items—
Automobiles	plows, cultivators, etc.
Caustic soda	

Surely American industry at this time needs these orders.

Edge Law Solution

The Foreign Trade Financing Corporation, to my mind, offers the solution of the manufacturers' problems. As I view the big fundamental thought back of the Edge Law, I see in it this problem solved—let

(Continued on page 403)

EARLY STEAM NAVIGATION ON THE PACIFIC

By ELWIN M. ELDREDGE

STEAM navigation on the Pacific Ocean, as near as records show, commenced with a small steamer of 109 tons, known as the *Beaver*. She was built by Messrs. Green, Wigram & Green, at Blackwall, on the Thames, in 1835. She measured 101.4 feet by 20 feet beam by 11 feet deep. Her machinery was made by Boulton & Watt, the builders also of the engine for Fulton's Clermont, the first recognized successful commercial steamboat.

The Beaver

The *Beaver*, rigged as a brig, left England on August 27, 1835, for the Pacific under the command of Captain Home, and had the bark *Columbia* as her consort. She made the voyage to the *Columbia* River in 204 days, arriving there on March 19, 1836. Her engines being placed in commission, started her trial voyage on May 16. It is recorded in her log-book as follows: "Carpenters stripping paddle-wheels. At 4 p. m. engines got up steam, tried the engines and found to answer very well; at 5 o'clock, came to anchor and moored in our old berth; at 8 o'clock all hands were mustered to splice the main brace." The nautical phrase "splice the main brace" is used in reference to a custom, then common, of celebrating particular events by serving out a liberal supply of rum. (Happy days of '36.)

The *Beaver* was built for the Hudson's Bay Company, but continued her rounds between Puget Sound and Alaska under different owners, with remarkable regularity and success. She was wrecked by running upon the rocks near the entrance to Vancouver Harbor in July, 1888.

First American Line

Before 1845, our experience with ocean steamships had been very limited and, in fact, 1847 marks the first American ocean steamship line.

When the gold fever broke out in this country in 1848 there were not more than six or eight ocean steamships in service and they were on established lines. The "old" Pacific Mail Line had, at this time, two side-wheel steamers under construction for the California trade. Sailing vessels were first used by those who ventured West at the time. In October, 1848, the first three vessels sailed, being sent by the War Department. The greatness of the fever is shown by the fact that in one month from December 14, 1848, there were cleared from New York for the West, six ships, five barks, five brigs and one schooner, carrying approximately about 665 passengers and each ship loaded with freight to the limit of its capacity; and from Boston, during the same intervals, nine sailing vessels, carrying 325 passengers and freight. During the year there left here nearly 30,000 persons in all classes of ships, among which there are records of but eleven steamers.

Days of Forty-nine

It was during the latter part of 1849 that the real



See note below on this page

sound steamers of that date. She was in command of Captain Edward W. Wakeman.

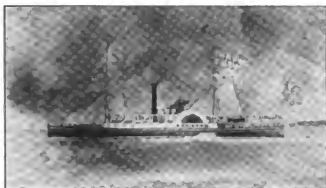
It is related of this ship that there were some debts due certain people for material used in her construction, and as the time for launching approached, the sheriff placed officers on board with a process. The vessel was launched with steam up and made a trial trip immediately afterward and carried these process servers down the bay. Having thus been kidnapped, these officers had the choice of going to California with the vessel or ashore in a small boat. They followed the latter course, and the *New World* proceeded on her voyage.

The vessel made San Francisco in 152 days and was afterward placed on the Sacramento run and commanded by Captain Samuel Seymour until his un-

Editor's Note: The illustration in the insert at the head of this page is taken from an old stereoscopic photograph published by Bradley & Rulofson, Gallery of Photographic Art, 429 Montgomery street, San Francisco. From the inscription on the back we learn, "This magnificent establishment employs the most skillful artists, produces the finest portraits, is the largest and best appointed gallery on the Pacific Coast, and has the only elevator connected with a photographic gallery in the world."



Steamship *New World*. From an old painting in possession of the author



Paddlewheel steamer Senator. From an old painting in possession of the author

timely death in 1859. The New World was the winner of many races with other rival steamers and was known as the Favorite on the river. Captain Seymour also commanded the Senator, of which we shall speak later. He was one of the best known and highly respected of early California sea captains.

Two other vessels that made the voyage round the Cape were the Antelope and Confidence, comparatively new steamers built for New York Bay service.

The Wilson G. Hunt, a small river boat that had seen service on the New York and Coney Island run, met with many mishaps on the way. She sailed from New York on March 3, 1850, encountering a very severe gale on March 9 and narrowly escaped foundering, her upper works being almost wholly wrecked from the terrific violence of the storm. She put into one of the Bermuda Islands for repairs and proceeded later on her journey.

The Rhode Island

The story of the Rhode Island's fatal journey and of her foundering on January 30, 1850, is of interest. This steamer was built for the New York and Providence run in 1836, but had outlived her usefulness on that line and had been laid aside as a spare boat. She was sold at a high price and only scantily refitted or prepared for her journey. She sailed from New York on January 25, 1850, heavily loaded with provisions and coal, and with little or no freeboard. Four days later she ran into a heavy gale, and after laboring heavily in the violent seas for some twelve hours, began to leak; her engine refused to work, while her steering gear became deranged, and after a few hours of horrible torture to the crew and passengers, she sank. There were some thirty-two souls that lost their lives. About twelve passengers and crew escaped in a small boat to a passing schooner.

The Senator

There was still another type of vessel that started on the long journey via the Straits of Magellan. These vessels were from the coast of Maine and built more substantially than those already named. Of this type were the Senator and W. J. Pease. They had also run outside from New York to Philadelphia.

The Senator was built for Mr. James Cunningham in 1847, and was commanded while on the Philadelphia run by Captain Samuel Seymour, who afterwards went to California to command her there. The Senator on her first trip to Sacramento was found to draw too much water and was placed on the coast runs. She was later sent to Australia and broken up about 1876.

Two screw steamers of about 300 tons each, the General Warren and the Commodore Preble, that had been

on the New England coast, also started on the trip. They were nine months in arriving at their ultimate destination, as they were detained at some ports on the Pacific side for repairs, and at others for the scarcity of coal.

A New York and Sandy Hook tug boat named Goliah also made a successful trip and was in service on the Pacific Coast until about 1897. The Goliah was built in 1849 at New York, and measured 154 feet over-all, 30-foot beam and depth of hold over 9 feet. Her tonnage was 235.86 gross. She left New York April 1, 1850, and reached San Francisco on January 1, 1851. The crew of that vessel had the trial of their lives on the voyage. She was 279 days between ports.

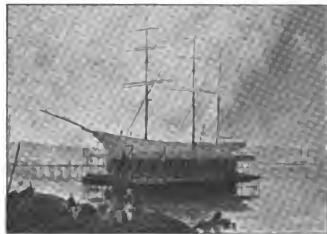
A vessel named the New York, a sister ship of the New World, started for the same destination a few months later and was four months reaching Rio Janeiro, and beyond there all trace of her is lost.

The Wilson G. Hunt was very unfortunate, as has been noted. She was laid up at Montevideo for nearly three months for a crew and at other ports for repairs. The trip took her 322 days.

There were many more vessels of the types mentioned that left Atlantic ports at the same time and encountered the same difficulties and trials. Many were never heard from after leaving the home port. Those that were so fortunate in reaching their destinations were compelled to call at every principal port on the way for coal, water, provisions and repairs to the vessel, and in many cases were detained by illness of crew from fever contracted in the warm climate.

The first American steam vessel that was engaged in the foreign trade on the Pacific Coast was the propeller Constitution of 500 tons, built at Philadelphia, Pennsylvania, in 1848, which arrived in San Francisco from the Sandwich Islands in 1851. There were also the New Orleans, a steamer also built in the East, which arrived from Sydney, N. S. W., in 1853, and the City of Norfolk, which arrived from Honolulu during the same year.

In the early fifties regular steamship lines were established on the Atlantic and on the Pacific Coasts with connections across the Isthmus of Panama, and it became a comparatively easy and regular jaunt for business men and others to go back and forth between San Francisco and New York. If these few disjointed notes of the earlier pioneer voyages through the Straits of Magellan serve to quicken the memories of some ancient mariner, they will have served their purpose.



Cowles drydock at the foot of Chestnut street, San Francisco. From a painting by Harry Eastman. This is said to have been the first floating dock in San Francisco Bay.



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J. S. HINES
B. N. DECOBBE
A. J. DYER
ANDREW FARRELL

Publisher
Business Manager
Editor
Associate Editor

NEW YORK OFFICE
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M. B. STEWART, Manager

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NEW SHIPPING BOARD

AT last, after many months of patient waiting, we have the announcement of the personnel of the complete Shipping Board appointed by President Harding and confirmed by the Senate. We append hereto the list of the personnel of this complete board, together with a brief summary of their experience and present status in the business world.

Two facts stand out prominently in this personnel—first, neither of the principal ports of the United States, San Francisco and New York, is represented on the board; second, there is almost no practical shipping experience represented. We take it for granted that President Harding, having put so much thought upon the matter of the selection of this board and feeling very keenly his own responsibility for the problems which await solution in the future of the American merchant marine, has made his selections with a definite policy in view. We know that the policy of the administration, as expressed in any public utterances, is that the Shipping Board shall get out of active participation in the shipping business as quickly as possible, and we gather from the composition of this new board that the President wishes the policy of the board to be one of supervision over our maritime trade and our participation in international shipping policy.

Mr. A. D. Lasker, the chairman of the new board, brings to the solution of the problems facing him in his new position a very wide experience as an executive and administrator of large business affairs and a tremendous fund of energy, both of which should stand him in good stead in the task that is before him. He bespeaks from the nation the confidence and pa-

tient co-operation of its business men and promises to put into effect immediately a good business administration throughout the Shipping Board offices. Mr. Lasker has also had a very wide experience in what might be termed business diplomacy and has gained for himself a very enviable reputation for the prompt and quiet settlement of business disputes to the satisfaction of all parties concerned. This sort of experience is very much needed in official life at Washington and particularly it seems in all matters pertaining to the Shipping Board, and we are hoping that under the new regime we will see less talk and more action, less investigation and more accomplishment.

The personnel of the full board is as follows:

A. D. LASKER, Chicago, chairman, representing the interior states; head of the Lord & Thomas Advertising Agency of Chicago; professional advertising man and business advisor; prominent in Republican politics; a stockholder and director in numerous important industrial corporations; inexperienced in shipping problems but an expert organizer and executive of large business concerns.

ADMIRAL WILLIAM S. BENSON, representing Atlantic Coast States; Democrat; former chairman of the Shipping Board; wide experience as a naval officer, and for almost a year in sole charge of all of the affairs of the Shipping Board.

GEORGE E. CHAMBERLAIN, Portland, Oregon, representing Pacific Coast States; Democrat; has served as governor of Oregon; two terms as United States Senator from Oregon, during which time he was a member of the Senate committee on commerce; has always been regarded as a safe, conservative student of and friend to the American merchant marine.

MEYER LISSNER, Los Angeles, representing Pacific Coast States; attorney; Republican politician and publisher who has been prominently identified with the development of the harbor of Los Angeles.

T. B. O'CONNOR, Buffalo, representing Great Lakes States; Republican; president of the International Longshoremen's Union and prominent in many negotiations for the settlement of disputes between marine workers and shipowners.

EDWIN C. PLUMMER, Bath, Maine, representing Atlantic Coast States; Republican; admiralty lawyer, prominently identified with sailing ship operation; secretary of the Atlantic Carriers' Association.

FREDERICK I. THOMPSON, Mobile, Alabama, representing Gulf States; Democrat; newspaper publisher; no connection with shipping affairs; appointed member of the Shipping Board by President Wilson and serving ad interim.

SELLING SHIPS

IT has been stated by those in position to know that the present book value of the fleet of steamers owned by the Shipping Board is very close to \$5,000,000,000, including the monies expended in plant, the monies lost in operation, and all of the various overhead and other expenses not directly involved in the actual building cost of the ship itself. If this statement be correct, then the American people are due to write off as a loss about \$4,000,000,000.

This sum, almost incomprehensible, is not nearly so staggering in its effect on the imagination when we consider that the money was all spent in America, the great bulk of it is still in America, quite a sizable proportion of it was gathered in by the United States government almost immediately after its expenditure in the way of excess profits and income taxes, and it is not a loss which is to be incurred now but a loss

which has already been largely absorbed by the people. The ships which are the result of this huge expenditure are in the main good ships. They are here for our use, and it will be the business of the new Shipping Board to see that we get as profitable use out of them as possible.

The first step toward making profitable use of the fleet is this writing off of a large proportion of the value. It is not at all likely that a large number of the ships will be sold immediately, even with this great reduction. As we have pointed out frequently in recent issues of *Pacific Marine Review*, the present ship market will not absorb a large amount of tonnage, even if that tonnage should be a free gift.

Mr. James Farrell, president of the Foreign Trade Council, who is in a position to know as well as anyone in the United States, has made the statement that under normal conditions of trade it would take three years or more to absorb the present merchant tonnage of the world into useful and profitable trade routes. The problem of the Shipping Board in selling the ships is to make a market for the ships by removing as far as possible all of the legislative and other restrictions which now stand as a barrier to the successful competition of ships under American registry in foreign trade. This will take time—probably will be a matter of a number of years—and during the passage of that time the only sensible plan for the Shipping Board in the management of its fleet is the bare boat charter plan with charter rates based on a valuation of the fleet, which shall be on terms of equality with the current value of ships in the world market for ships.

EIGHT HOURS AT SEA

THE proposal to impose the eight-hour day conditions at sea is prominent to the front just at present on account of the issuance of a report from the International Labor Office at Geneva. This report was the result of an inquiry into the application of the eight-hour act in the French mercantile marine.

This French eight-hour act was passed on August 2, 1919, and supplemented by a decree on the 24th of February, 1920. Prior to the passage of the act of August 2, 1919, the rule was the two-watch system and the twelve-hour day. In the case of duty in ports and sheltered roadsteads officers and crew performed work on a basis of a ten-hour day.

It has always been maintained by shipowners that there was no real need or reason for the application of the eight-hour day at sea, as the work performed by the crew is never of a nature that is very fatiguing and, in the nature of the case, the crew is unable to leave the ship. Board, lodging and all other incidentals in the life of the workman are provided, so to speak, at the point of application of the work and a considerable part of that work is in the nature of keeping in order the ship in which he lives. There is not the same necessity in such a case for the application of the eight-hour law, either from a physiological or sociological viewpoint, as there is in the case of the tradesman or office worker ashore, who frequently has to travel an hour or more in the morning and in the evening going from his home to his work, whose work is of a much more fatiguing character, and whose family is constantly making demands on his time.

That there is a great deal of truth in these contentions is abundantly proven by the report in ques-

tion, which brings out the fact that the principal result of the application of the eight-hour law at sea has been increase in overtime paid to all classes of workers at sea, and particularly to the general service class such as stewards and waiters on ocean liners. The object of the passage of this eight-hour law is, therefore, in this particular application entirely vitiated. The government passing the eight-hour law for sociological reasons in an effort to improve the conditions of life of the worker is confronted with the hard fact that in this particular instance, to quote the report, "an appreciable part of the personnel on board ship is not unduly fatigued by its normal work. Its ambition is not centered on rest. On the contrary, it welcomes overtime work, which means increased earnings."

The report goes on to show that this system has brought about an increase in the expense of operating vessels which varies from 70.68 francs per gross ton per year for ocean going cargo steamers to 133.36 francs per gross ton per year for ocean going passenger liners. The report as issued by the International Labor Office features letters from M. Rio, under-secretary of state at the Ministry of Public Works in charge of ports, mercantile marine and fisheries. M. Rio writing from Paris takes the stand that socially the act is a great success, that this social program, however, is being effected at the expense of French shipping companies, that the added expense to these French shipping companies may be ruinous, and that the only remedy is the internationalization of such a law so that the expenses of the shipowners of all nationalities may be increased in like measure. In this respect the report is a rather dangerous document, and the question arises why should such national propaganda be issued by an International Labor Office.

There is nothing in the life of a deckhand or ordinary seaman on our modern ocean going steamer that necessitates any such limitation as an eight-hour day. Large portions of his time on duty are essentially not different from his time off duty. We believe that the marine worker should get a square deal from his employer, that he should have comfortable quarters in which to live and good food to eat, properly prepared, and an adequate wage for the service which he performs, but we do not see any necessity for the average officer or deckhand on a cargo steamer being given sixteen hours a day in which to "loaf," and it is very evident from the overtime records in the French merchant marine that the men themselves do not feel any such necessity.

THE ARMY TRANSPORT SERVICE

IN a letter addressed to William S. Greene, chairman of the merchant marine and fisheries committee of the House of Representatives, the Pacific-American Steamship Association urges favorable action on H. R. 5348, which would withdraw army transports from the Honolulu and Manila trades. The letter in itself is so forceful and logical that little need be added, but this may be said: The association has not brought forward all that it might regarding the inefficient operation of the service. Those who have seen army transports loading or discharging at Honolulu or Manila have had their eyes opened to the marked inefficiency of this branch of the War Department; they have watched the Dix, for example, working at a leisurely rate that would shame any commercial line of the world—at a rate, to speak conserva-

tively, at least four times slower than any merchant vessel would employ. If it be argued that the War Department might as well berth the Dix at Honolulu as at Seattle, because there was no necessity of haste, then the retort may be made that the army has had considerable more tonnage than it required. The present is a good time to bring up the question, because the old transports must go to the scrap-pile soon. Their wasteful operation not only has cost the government large sums, but it has hindered the merchant marine greatly, for with the army and navy business as a nucleus, some American operator long ago would have established a direct line between San Francisco, Honolulu and Manila.

Direct Manila Service Opened

The letter of the Pacific-American Steamship Association to Mr. Greene follows:

Confirming our night letter of June 7, urging favorable action on H. R. 5348, amending Sections 17 and 19 of the Merchant Marine Act of 1920, beg to submit the following arguments for recommending a withdrawal of the United States Army transports from the trans-Pacific and Hawaiian trade:

First: The United States Shipping Board has allocated to the Pacific Mail Steamship Company three 522-type freight and passenger vessels, which are being operated direct between San Francisco and Manila and the East Indies, and five of the 535-type freight and passenger steamers, which will be operated between San Francisco and Manila via Japanese and Chinese ports. These vessels will furnish practically three sailings per month. We append statement covering the particulars of these vessels which may be of interest.

Second: The above vessels are exceptionally well adapted for the handling of government freight and passengers and are much speedier than the present United States transports, and in this connection we append proforma schedules from which you will note direct monthly service and fortnightly service via Japan and China is provided to Manila or express sailings three times per month.

Matson Service to Hawaii

Matson Navigation Company also maintains a service between Pacific Coast ports and Hawaii. They are at present operating two of the large West-type vessels of the Shipping Board, carrying freight only, and two of the 535-type steamers out of Baltimore that touch in at San Francisco, carrying freight and passengers to Hawaii. In addition to these, nine of their own steamers, six of which are passenger vessels, are regularly operated in passenger and freight service from San Francisco to Honolulu, sailing once a week.

Third: At present these vessels are sailing from San Francisco only partially loaded on account of lack of tonnage, and the operation of the United States army transports in direct competition with them merely makes both Shipping Board and army vessels unremunerative at public expense.

Burden on Taxpayers

Fourth: The army transports, by reason of taking cargo in but one direction and maintaining separate forces and terminals, cannot transport freight as economically as merchant vessels engaged in regular trade and the continuance of the transports is merely entailing a large additional burden on the taxpayers of the country without any corresponding benefit.

Fifth: Owing to a large number of the United States Shipping Board vessels being tied up for lack

of cargo, every effort should be made to try to reduce the enormous losses to the government by providing passengers and freight and the withdrawal of these transports would, to that extent, assist in this direction.

Sixth: The late war proved conclusively that transports cannot be utilized until after the navy has cleared the seas, and then the first call is for commercial vessels to transport troops and supplies, and if the American merchant marine is maintained and assisted it would furnish immediately available and invaluable assistance in case of war.

Buy Coal in Orient

Seventh: The operation of commercial vessels in competition with vessels of other countries necessitates the highest efficiency and economy, and the present system of carrying cadets and educating young men as officers would form a most valuable asset in providing a proper personnel (both officers and crew) for use in time of trouble.

Eighth: The United States army transports today returning from Manila purchase large quantities of Chinese or Japanese coal at very high prices for use in their operation, thereby depriving American firms of the sale of such fuel, whereas American commercial vessels utilize American oil and coal almost exclusively in their operation.

Ninth: All the leading maritime nations of the world transport their troops and supplies by private steamship companies under normal conditions, but maintain certain transports for the handling of large bodies of troops or live stock. If the experience of Great Britain and other nations has proven this the most economical and satisfactory method of handling their army supplies, it should be equally applicable to the United States.

Accommodations Guaranteed

Tenth: The Pacific Mail Steamship Company is prepared to handle immediately the entire army and navy freight requirements for Manila at rates as per tariff enclosed. It is also prepared to immediately take care of the normal movement of officers and enlisted men and will set aside accommodations to be held subject to government order at fares as per tariff attached.

Matson Navigation Company is also prepared to handle a movement of army and navy freight requirements to Hawaii.

Eleventh: In the event of any unusual movement of supplies or troops, both Pacific Mail Steamship Company and Matson Navigation could, with proper notice, readily provide additional tonnage.

It apparently resolves itself into the question of whether an antiquated and expensive system, based upon precedent, shall be continued without any resultant benefits, or whether this expense can be saved to a large extent by utilizing American commercial vessels and the American merchant marine be benefited to that extent.

The vessels of the United States Shipping Board belong to the people and are operated for their account and it would appear that another department of the government can have no excuse for maintaining a separate and expensive service for no apparent cause. We therefore respectfully urge that your committee favorably recommend passage of H. R. 5348.

The present American merchant marine which, ultimately, will be owned by private American companies will be able to perform every national function in times of both peace and war.

(Continued from page 397)

me first illustrate the point before drawing the conclusion.

At the present time the Roumanian, the Swiss, the Swede, or any other foreign nationality finds itself limited, in this country, to raising money only from its own former nationals. The Roumanian business house that wishes to get credit in this country can practically get credit only from the Roumanian-American; the Italian must go to the Italian-American, and so on down the line. Surely, the Roumanian oil wells, the Roumanian railroads or the Roumanian customs revenue means nothing to the average American investor. The Roumanian business man cannot secure assistance, therefore, at this time, from other than people of his own race who have emigrated to America.

The Foreign Trade Financing Corporation through its debentures speaks in American dollars to the American investor, and the American investor need only have faith in the vast capital of the corporation and in its management. Surely, it is axiomatic that this faith will follow. It is unthinkable that the management will not be both able and of a superior order.

Possible Profits

From the standpoint of the manufacturer investing a reasonable amount in this enterprise, I draw the following conclusion as to profits. Let me illustrate again by example:

Take the case of a manufacturer doing \$200,000 exporting annually. Grant his profit is 15 per cent net on his sales. Fully one-half to two-thirds of his tenders of orders at this time require long time, which he has not been in the habit of granting. He is, therefore, turning down orders daily. Assuming that only one-half of his prospects die by virtue of his inability to finance, that represents a profit of \$15,000 that he is losing. Surely, such a manufacturer can afford to invest \$10,000 in the stock of a corporation that will make it possible for him to earn \$15,000 within a year.

It must further be obvious that this manufacturer will benefit by the freer movement of capital in foreign countries and a larger measure of short time payment orders will be given.

I cannot help but feel that the American investing public who now loan vast sums on the security of a farm, a house or a factory, will realize that the safety of the debentures contains within it more security than any such mortgages as he is now freely investing in. Back of the debentures will be the huge capital guaranty and back of that again, in each case, will be the large variety of collateral, which will in the aggregate create a law of averages that will be so certain to insure repayment to the corporation as to make the risk infinitesimally small to the investor in the debentures.

The manufacturer who invests in the stock of the Foreign Trade Financing Corporation will be amply repaid. It will be a profitable investment. It will help every manufacturer and business man in the country. It will solve employment problems and restore the general prosperity to which progressive industry is entitled.

Tariff Considerations -

In closing I want to protest most strenuously against the viewpoint so prevalent and now so often expressed to the effect that we must keep down the tariff bars to our own markets. This viewpoint is on the theory that the only way Europe can pay is to flood our markets with goods. We could better afford to give our

foreign friends the funds direct with which to rehabilitate themselves.

I submit that it is rank financial heresy to throw a \$6 a day man out of a job in this country and substitute a \$1 a day man in Europe, which is a starvation wage at best, and expect a saving to accrue out of the dollar that will compensate the American workman for the loss of his \$6 a day job.

I submit further that the world's purchasing power has been reduced five-sixths under this plan and the American purchasing power has been reduced six-sixths. I desire to commend President Harding for his sane attitude on this thought. America's export business will never be built up on a foundation of destruction of its domestic market. I believe that the proper plan is to invest our surplus in foreign securities of the Foreign Trade Financing Corporation now organizing.

SHIP NAMES

A SERIES of errors in spelling of ship names which have occurred in Pacific Marine Review and which have also appeared in other publications leads us to observe, as we have often done before, that America seems very poverty stricken in proper names for ships. This series of errors culminated in a description of a shipbuilding program of an eastern shipyard in which the names of forty vessels were listed, and out of the forty ten were so misspelled that it was impossible to recognize in the names published the original names as given to the ships. On checking this matter up we found that the mistakes in spelling originated in the publicity department of the shipyard that had built the ships, and we of course were comforted by the thought that if a shipbuilder could not spell the name of a ship that he himself had built, a poor editor who had never even seen the ship should not be expected to be able to correct the spelling.

It has, however, occurred to us that while the Shipping Board was carrying out its emergency program and supplying names to the builders, the builders were all fiercely indignant about the character of the names supplied. Much mirth was indulged in at the expense of various individuals who were supposed to have supplied these names. Now, however, when the yards are full of vessels building for private account, the names seem to be very little better. We are still getting all sorts of atrocities in the way of names not understandable to the common mind and not spellable by any rules in the dictionary. It seems as if the Shipping Board Emergency Fleet program has set the fashion and we are following like a flock of sheep.

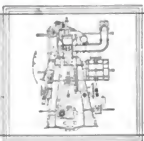
It is time American ship builders realized the publicity value of having characteristically American names on American ships.

Since writing the above, we have accidentally stumbled on a "hunch" which indicates, dear reader, as plainly as the proverbial nose on your always "intelligent" face that the names now adorning the prows of the brave ships of our merchant marine are in all truth and soberness American names gathered from American sources. The names are taken from those characteristically American institutions, the Pullman sleepers.

This illuminating idea came to us with all the force of an inspiration one evening last week while listening to a college professor from Ohio entertain the assembled company with a recitation of Mr. Dooley's experiences on a sleeping car.



Oil Engines and Motorships



PERFORMANCE OF AN AMERICAN MOTORSHIP

Kennecott Makes Good Record for Fuel Economy

IN the May issue of Pacific Marine Review we described in a general way the propelling machinery of the motorship Kennecott built by the Todd Drydock and Construction Corporation of Tacoma for the Alaska Steamship Company and gave some figures for her performance on the initial run from Tacoma to San Pedro.

Since that article was published the Kennecott has completely vindicated our prediction that she would make a great record for herself as an economical cargo carrier. She has completed her voyage from Puget Sound to New York via Panama, and figures are available from the engineer's log to show just what her performance in the way of fuel consumption was on this 5800-mile run.

It will be remembered that the Kennecott is propelled by a set of McIntosh and Seymour 6-cylinder directly reversible full Diesel marine oil engines of 1200 I. H. P., each driving twin screws at 140 R. P. M.; that her auxiliary machinery is all electrically operated, power being provided for that purpose by two 100 H. P. McIntosh and Seymour full Diesel engines driving two 75 kilowatt General Electric generators.

Before taking up the consumption record of the main engines on this sea voyage, it is interesting to note the port consumption loading lumber at Aberdeen, Washington. The Kennecott had previously stowed in her holds at Tacoma a considerable amount of copper ore from the Tacoma smelter. At Aberdeen she loaded 2,500,000 feet of lumber which would weigh not less than 3600 tons. For the handling of this lumber and for lights on board and for galley stove consumption the total fuel used was 755 gallons. As the average galley range fuel consumption on this ship is one-half barrel daily, and this fuel record covered six days, there would be a galley consumption of 126 gallons which could properly be subtracted

from the 755-gallon total, leaving 629 gallons as the fuel consumed in providing lights for the ship and power for the winches. This 629 gallons put on board 3623 tons of lumber, or 5.7 tons per gallon—239.4 tons per barrel, or 208,000 feet board measure per barrel of oil.

If steam schooner operators will compare these figures with the fuel consumption of ordinary steam winches in handling lumber, they will have their eyes opened to one of the great advantages of Diesel operation plus electric deck machinery which is not often thought of in comparing the ordinary steamer with the properly fitted motorship. Such a record for fuel consumption in cargo handling is made possible by the wonderful fuel economy of the full Diesel engine at fractional loads, combined with the efficiency of electric motors under all conditions of load and the diversified load factor. No such economy is even approachable with the use of steam supplied from either the donkey boiler or main boilers of a steamship. From figures available for some of the finest steam freighters on the coast handling uniform loads of sacked goods under the best possible conditions of dispatch we find that the tonnage per gallon of oil would figure less than six-tenths of a ton per gallon, so that for this particular record of the Kennecott her electrical equipment supplied by power from Diesel-driven generators may be said to represent an advance in fuel economy of between 900 and 1000 per cent over good commercial practice with the steam winch. As also noted in these columns in the June issue, the electrical deck machinery and the steering gear of the Kennecott were manufactured by Allan Cunningham Company of Seattle. For a more complete description of this apparatus the reader is referred to the article in the June issue.

After loading this lumber, the

Kennecott's draft condition showed that with the lumber and ballast and some miscellaneous freight she had on board in the neighborhood of 5600 tons deadweight of cargo. From Aberdeen to Panama she logged 3895 miles at an average speed of 10.8 knots per hour on a total fuel consumption of 1030.7 barrels, while from Panama to New York she logged 1946 miles in eight days at an average of 10.1 knots per hour on a fuel consumption of 557.2 barrels, a total of 5841 miles with 5600 tons of cargo on 1587.9 barrels of oil, or 3.68 miles to the barrel. Reducing this to ton miles, we get 20,608 ton miles to the barrel, or in round numbers 490 ton miles to the gallon. This figure will prove another eye-opener for steamship operators if they will compare it with what they are at present getting on their oil-burning steamers of the same deadweight capacity and speed, and in making this comparison it will be borne in mind that we have here assumed from the draft conditions that the Kennecott was carrying only 5600 tons, whereas she has a capacity for 6500, and the additional load would have made little, if any, difference in her fuel consumption.

The entire voyage of the Kennecott was without incident in the engine room worthy of note. The engines and the auxiliaries functioned perfectly. In automobile parlance, they "never missed a shot."

We are glad to be able to record these figures and facts for the sake of American marine engineers who seem to have been blind in recent years to the tremendous advance that has been taking place in marine Diesel engineering across the waters and to the wonderful record which European motorships have been maintaining both in regard to economy and low maintenance costs and in respect to taking the business away from American and British steamships.

STEAMER OR MOTORSHIP

An Instructive Comparison of Earning Capacities

THE following tables and descriptive matter are taken from a very interesting paper on "The Internal Combustion Engine as Applied to Marine Propulsion," which was prepared by John F. Metten and J. C. Shaw and read before the Society of Naval Architects and Marine Engineers at New York, May 26, 1921. This comparison will be of especial interest to Pacific Coast operators and owners as the voyage for which the figures were compiled is that from San Francisco to the Orient. In this comparison all possible advantage is given to the steamer, and some minor savings usually effected by motorships in active practice are omitted.

The size of vessel chosen has the same general dimensions as the motorship Afrika, owned by the East Asiatic Company, and which is similar to the William Penn and the two motorships building for the United American Lines.

The steamer is single screw with double reduction gearing and compound turbines and Scotch boilers. The revolutions for the vessel are taken as seventy, which is conservative practice, to favor propulsive efficiency which for convenience here is assumed the same as the twin-screw vessel.

The ships are of the awning-deck type, having a nominal deadweight carrying capacity of 13,000 tons when loaded to 31 feet 5 inches draught. They are 445 feet between perpendiculars, 60 feet beam and 42 feet molded depth, with a block coefficient of .782. The shaft horsepower of the turbines is taken as 3500, which is equivalent to the 4500 indicated horsepower of the Diesel engines. The cost of the vessels to build, based on probable cost of labor and material in the immediate future, is assumed \$150 per ton for the steamer and \$165 for the motorship. The \$200,000 additional cost of machinery for the motorship, including deck machinery, is considered fair where the Diesel work is well standardized.

The fuel oil consumption at sea for the steamer with 16 degrees Baume oil is taken as .95 pounds per shaft horsepower, all purposes, which should be realized in service with properly designed turbines and double reduction gear and co-ordination of auxiliaries. For the motorship, with oil of 22 degrees Baume, the consumption is taken as .31 pounds per indicated horsepower, all

purposes, which is usual with motorships belonging to the East Asiatic Company. The cost of oil in American port, per recent quotations, is \$2 for fuel oil for steamer and \$2.30 for Diesel oil of gravity indicated. It is necessary for the steamer to take on additional oil in a foreign port which is assumed double that in an American port.

The route chosen is from San Francisco to the Far East and return, calling, for example, at Yokohama, Hongkong, Manila and Honolulu, with a total distance of 15,500 knots. The number of days at sea and in ports is taken from percentages for similar vessels operat-

ing over similar routes, and the number of days in port include that for loading and unloading, repairs and docking, holidays, etc.

The cost of personnel is based on scale of wages in effect the first part of this year with sustenance at \$1.25 per man. This is estimated with 27 for the deck officers and crew for either vessel, and for the engine-room 19 and 14 men respectively for the steamer and motorship.

The freight rate for bulk cargo is estimated as \$27 per 100 cubic feet and for deadweight cargo as \$13.50 per ton, which is fairly well in accordance with present rates.

The itemized figures are as follows:

	Steamer	Motorship
Displacement, tons	18,690	18,730
Gross tonnage, tons	9,050	9,050
Actual mean sea speed, knots.....	11.5	11.5
Revolutions per minute	70	115
Indicated horsepower	4,500	4,500
Shaft horsepower	3,500	.....
Total weight of machinery (tons), including pipes, ventilators, ladders, floor plates, spares, tools, outfit, propellers, shafting, etc.....	690	911
Water in system, tons.....	115	14
Weight of deck machinery, tons	140	155
Weight of hull, fittings, equipment, etc., tons.....	4,575	4,600
Light displacement, tons	5,520	5,680
Capacity deadweight, tons	13,170	13,050
Capacity (bales), cubic feet	590,000	620,000
Oil bunker capacity, tons (double bottoms).....	1,320	1,350
Oil bunker capacity, tons (tank between tunnels).....	.....	120
Oil bunker capacity, tons (settling tanks).....	80	20
Total oil bunker capacity, tons	1,400	1,490
Oil consumption per shaft horsepower, main engines, all purposes, pounds	0.95	.....
Oil consumption per indicated horsepower, main engines, all purposes, pounds .....	.....	0.31
Oil consumption per day at sea, tons.....	35.65	14.95
Oil consumption per day in port, tons.....	5.5	.7
Number of days at sea, per annum.....	220	220
Number of days in port, per annum.....	145	145
15,500-Knot Voyage		
Days at sea	55.5	55.5
Days in port	36.5	36.5
Total oil consumption at sea, tons.....	1,980	830
Total oil consumption in port, tons.....	200	26
Reserve oil bunker (for about six days), tons.....	220	90
Total oil carried outbound, tons.....	1,400	946
Total oil burned on trip out, tons.....	1,090	428
Total oil necessary, homebound, tons.....	1,310	518
Oil to be purchased abroad, tons.....	1,000	0
Weight of crew and stores, tons.....	50	50
Fresh water on board at start of each leg, tons.....	300	75
Total weight of vessel, including fuel, water, etc., outbound, tons	7,270	6,751
Total weight of vessel, including fuel, water, etc., homeward bound, tons	7,180	6,323
Cargo capacity, outbound, tons.....	11,420	11,979
Cargo capacity, homebound, tons.....	11,510	12,407
Cargo capacity, average (two ways), tons.....	11,465	12,193

Cost of Operation per Voyage

Insurance (4%): depreciation (5%), 92 days.....	\$44,200	\$48,800
Brokerage, at \$1.15 per ton cargo capacity.....	3,440	3,660
Overhead and general expense at \$20 per gross ton, per annum.....	45,600	45,600
Fuel oil.....	45,900	15,260
Water, at \$1 per ton.....	600	150
Deck officers, crew, stewards.....	12,200	12,200
Engineer personnel.....	9,300	7,600
General stores, deck, engineers and stewards.....	5,000	5,000

Totals.....	\$166,240	\$138,270
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Loading and discharging of deadweight tons at \$1 per ton and 75% of cargo capacity.....	\$17,200	\$18,280
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Total.....	\$183,440	\$156,550
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Loading and discharging of bulk cargo at \$2 per 100 cubic feet at 75% capacity.....	\$17,700	\$18,600
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Total operating cost for bulk cargo (per voyage).....	\$183,940	\$156,870
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Comparison of Earnings with Deadweight Cargo Carried

Tons per voyage outbound at 75% capacity.....	8,580	8,980
Tons per voyage homebound at 75% capacity.....	8,640	9,300
Rate per ton.....	\$13.50	\$13.50
Gross revenue per voyage at 75% capacity.....	\$232,500	\$246,780
Cost of operation per voyage.....	\$183,440	\$156,550
Net revenue per voyage.....	\$49,060	\$90,230
Net revenue per annum.....	\$195,000	\$358,000
Per cent earned on investment.....	10	16.65

Comparison of Earnings with Bulk Cargo

Cubic feet of cargo carried out and return at 75% capacity.....	885,000	930,000
Rate per 100 cubic feet.....	\$27	\$27
Gross revenue for bulk cargo.....	\$239,000	\$251,100
Cost of operation per voyage.....	\$183,940	\$156,870
Net revenue per voyage.....	\$55,060	\$94,230
Net revenue per annum.....	\$218,500	\$374,000
Per cent earned on investment.....	11.2	17.4

From the foregoing it will be seen, for the particular conditions chosen, that the motorship has an increased earning capacity over the steam vessel of 66 per cent on deadweight and 55 per cent when bulk cargo is carried. In addition to the bulk cargo, there can be carried on the outbound trip 544 tons of oil, which at \$13.50 per ton will increase the amount earned on investment from 17.4 per cent to 18.73 per cent, or 67 per cent better than the steamer.

The above figures can be used as a basis for working out a comparison for any route which will vary directly with length of voyage and the size of the vessels employed.

M. S. William Penn

A brief description of the motorship William Penn will be given, as it was the first large vessel of this kind owned by the United States Shipping Board. The performance of this vessel in service will be of particular interest, as it is to be operated over the same route and by the same operating company as the electrically driven ship Eclipse, recently put into service.

The hull, having been originally intended for a 3000 shaft horsepower single-screw turbine installation, is not exactly suitable to the Diesel engine installation of 4500 indicated horsepower, or 3500 shaft horsepower. For best efficiency, due to its high block coefficient, the vessel should not be driven over 10½ to 11 knots in service. The screws have accordingly been designed for lower turns than that for which the engines were intended, so that the designed mean indicated pressure, upon which the efficiency of engines somewhat depends, will be maintained.

The William Penn has a length between perpendiculars of 439 feet 6 inches, beam of 60 feet, depth molded to shelter deck of 36 feet 8 inches, and draught of 28 feet 4¼ inches, corresponding to 12,375 tons deadweight. The length of engine-room space was maintained the same as for the steam-driven sister ships. A built-up column was added to tie the middle of the engine-room double bottom to the shelter and bridge decks, to prevent possible synchronous vibrations being set up between the main engines and the hull's structure.

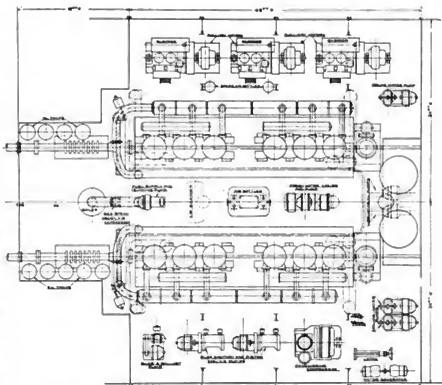
The main engines are, as previously stated, six cylinders, each of a bore and stroke of 740 mm. and 1150 mm., respectively. Along the port side are arranged the three auxiliary engines, each driving 65 kilowatt generators, and along the starboard side the maneuvering compressor and bilge and ballast pumps.



The new U. S. S. B. motorship William Penn, 12,375 d.w.t., engine with Burmeister and Wain direct reversible Diesel engine of 4500 h.p., on twin screws

The lubricating and salt-water cooling pumps are placed near the forward bulkhead and the fuel oil pump and reserve air compressor aft, between the main engines. In this vessel a fresh-water closed cooling system, with cooler and fresh-water pump, has been added for the cooling of the cylinders and covers. This is a precaution against mud being deposited in the spaces.

Editor's Note.—Additional interest is given to the comparison drawn in the above article by the evident intention of the new Shipping Board to immediately write off from their books a very large proportion of the cost price of their steamers. If they go at this kind of bookkeeping with sufficient resolution, the splendid steel steamers of the Shipping Board will be obtainable at a price which will enable private steamship operators to convert these steamers into profitable motorships and still have the motorship stand on the owner's books at a cost well within the limits of profitable operation at present freight rates.



Arrangement of Burmeister and Wain machinery in the new motorship William Penn

MOTOR SHIPBUILDING IN EUROPE

THE rapidly growing interest that is being shown in the motorship among shipowners in

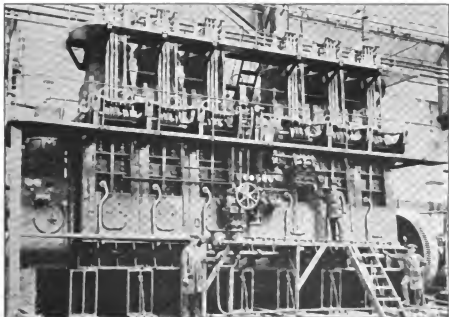
Europe is evidenced by the increased number of well known engine builders who are taking up the manufacture of machinery for installation in these vessels. Curiously enough, it is often the shipowners who force the engine build-

ers to commence constructing Diesel machinery, for they are now invariably asking manufacturers to quote alternatively for steamers and motor vessels. During the past few weeks two of the largest marine engineering firms in Great Britain have arranged to build Diesel engines, these being Palmers Shipbuilding & Engineering Company of Jarrow-on-Tyne,

who have acquired a Cammell Laird Fullagar license, and Kincaird & Company on the Clyde, who will build Burmeister & Wain machinery.

It is a surprising fact that, although the first large Cammell Laird Fullagar engine has only just been completed, it is the most popular type among the engine builders, for there are now five of the largest concerns in the United Kingdom building this design—namely, John Brown & Company, Ltd., David Rowan & Company, Dunsuir & Jackson, Palmers Shipbuilding & Engineering Company, and Cammell Lairds themselves. This fact forms striking evidence that engine builders do not always wait for results before they decide on the suitability of a new design, and it must be admitted that most European engineers are convinced that the Cammell Laird Fullagar engine has a very great future. There are now altogether twenty of the largest firms in Great Britain building motorship machinery, and it is a matter of interest that thirteen of these are constructing two-cycle engines.

There is apparently quite a considerable amount of enterprise being shown in the large marine oil engine industries in Great Britain. Several manufacturers have had the temerity to build large engines before receiving any definite order, and this, in fact, was the policy



One of the Harland and Wolff 1600 h.p. direct reversible marine Diesel engines for installation in the new motorship L303a for the Pacific Steam Navigation Company

adopted by Doxfords, who proceeded with the construction of four 3000 horsepower motors before an order had been received for any one of them. After the first was well on the way towards completion, the Transatlantic Steamship Company decided to order one, and as a result of the trials, placed orders for two more, so that three out of the four are now definitely contracted for. The fourth will be installed in a ship to Doxfords own account, if it is not disposed of before completion, which is highly probable.

5000 H. P. Camellaird Fullagar Engine

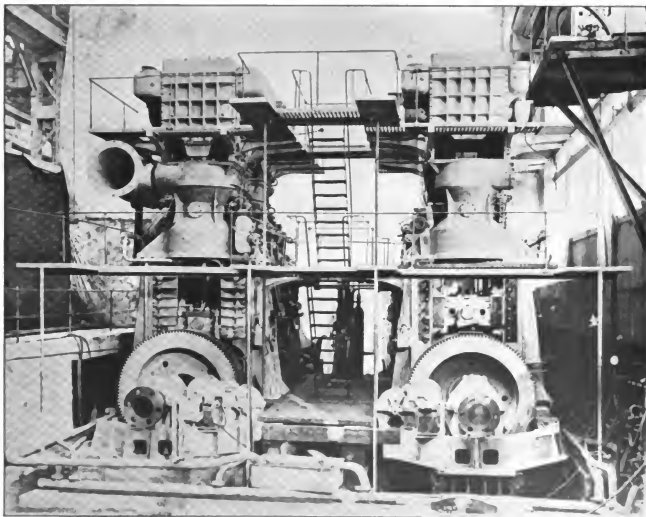
Somewhat similar enterprise has been shown by Cammell Lairds in the development of their remarkable Camellaird Fullagar engines, and although they have orders for two 500 b. h. p. sets and two sets of 1000 b. h. p., they were anxious to demonstrate the value of this type of motor for exceedingly large sizes, and therefore proceeded with the construction of four cylinders of a six-cylinder engine designed to develop 5000 b. h. p. when running at 95

r. p. m. This four-cylinder unit, therefore (which will be capable of extension to a six-cylinder engine), will develop about 3350 b. h. p. and will be the highest powered marine set that has ever been constructed. Most of the parts are now in the shops and erection will be proceeded with at no distant date. The cylinders have a diameter of 26 inches and the stroke is 42 inches; this size of cylinder for the relatively large output is, of course, extraordinarily small, so that the over-all length of the complete motor will be something of a revelation to those who are still skeptical of the possibilities of the Camellaird Fullagar engine, in the matter of space reduction in the engine room. The motor will be unusual in many respects, particularly in the arrangement of air compressors, since the designers have decided to fit two four-stage compressors on the engine, driven direct off the extension of the crankshaft. The main reason for adopting four stages is to equalize the upward and downward pressure and so obtain more perfect bal-

ance than is possible with a three-stage type. It is difficult to say what will be the ultimate destination of this engine, but it is not unlikely that a pair of these motors will be installed in a vessel for the Cunard Company.

Remarkably Low Fuel Consumption

A short description of the new 1000 b. h. p. Camellaird Fullagar engines may be given, as they differ in some respects from the 500 b. h. p. sets which have been already described and illustrated in Pacific Marine Review. The general principle of operation of this engine is well known. In each cylinder there are two opposed pistons, and the difference in application from the Doxford engine, which also is of the opposed piston type, lies in the fact that the cylinders are arranged in pairs and the top crosshead of the one piston is attached by diagonal rods to the bottom crosshead of the piston of the cylinder adjoining. It is claimed that by this means the engine is perfectly balanced, bearing stresses are reduced, allowing of the employment of shorter bear-



A pair of the popular Cammellaird-Fullagar opposed piston two-cycle type Diesel engines for installation in a motor cargo ship for the Brocklebank Line. These engines develop 1000 b. h. p. apiece

ings, and that vibration is eliminated in spite of the fact that the engine is exceptionally high.

In the 1000 horsepower engines there are four cylinders arranged in four units of two cylinders each, and the cylinders have a diameter of 18½ inches with a combined stroke of 50 inches. As is usual in the opposed piston type of engine, the scavenging air enters the cylinder at the bottom through a row of ports occupying the whole of the periphery, while the exhaust gases are discharged at the top. Perfect scavenging is thus obtained and an exceedingly low pressure is possible, this amounting to only 1½ pounds per square inch. The arrangement of scavenging pumps is unusual; they are located at the top of each working cylinder and are rectangular in section. The object of this is to utilize the top crossheads as the pistons of the scavenging pumps. Air injection is used for the fuel and a three-stage air compressor is driven direct off the end of the crankshaft. The scavenging air is discharged from the scavenging pumps to a scavenging trunk around the center of the engine which forms the support for the cylinders.

It was found in the first Camellaird Fullagar engines that there was a danger of cracks developing in the cylinder liner at the center. This was on account of the fact that there were no fewer than four holes bored in the liner, comprising that for the fuel valve, air starting valve, relief valve, and the indicator gear. In order to overcome this difficulty in the new engine, the designers have provided only two holes, one at the back and one at the front. The former is for the reception of the fuel valve and the latter for the air starting valve, the relief valve and the indicator, all provided from the one hole. The result is that cracks around the center are now most unlikely to develop. The method has the disadvantage that the air starting valves must be operated by levers from the camshaft, which is naturally situated in the front of the engine.

The camshaft is driven from the crankshaft by bevel gearing and a vertical shaft in the usual manner, and on this camshaft are mounted four cams for each cylinder for the operation of fuel and starting valves, one for ahead and one for astern in each case. Reversing is effected by moving the camshaft fore and aft, bringing the astern cams into operation, and it is noteworthy that it is unnecessary to remove the valve levers from contact with the cams, since

the lift of the fuel valve is so extremely small. This simplifies the reducing gear a great deal, and one hand wheel carries out all the movements necessary for setting the camshaft in the right position and admitting starting air and then fuel. The engineer therefore has only to turn the one hand wheel to the left or right to go ahead or astern, as the case may be. The engine is speeded up by means of the usual speed control lever acting on the suction valves of the four fuel pumps, and in addition there is another speed control lever for slow running which alters the lift of the fuel valves and thus economizes injection air. Clearly, with a two-cycle engine of this sort, the reversing mechanism and valve control gear are very much simpler than in ordinary four-cycle engines, where four valves are required to be operated in each cylinder, and the necessary ahead and astern cams provided in each case.

According to the test which was carried out on this 1000 horsepower engine, the remarkably low fuel consumption of 0.39 pounds per b. h. p. hour was attained. This, it will be noted, is probably the lowest recorded fuel consumption of any pure Diesel engine, whether two- or four-cycle, and comes within measurable distance of that attained with the Still combined steam and oil engine, which is said to be 0.32 pounds per b. h. p. hour. The question will naturally be asked whether the complication of the Still engine is desirable if the Camellaird Fullagar engine can approach so closely to the best results attained by it.

Geared Diesel Engines

It was in America that the idea originated of using geared Diesel engines on motorships and the Libby Maine, on which such installation was carried out, appears to have operated very successfully. The plan has now been copied by the Germans, but on a much larger scale, with a somewhat different object. The Hamburg America Line is showing great activity in motor shipbuilding, but the details are, as far as possible, being rigidly withheld. They are having a couple of 14,000-ton motorships constructed in which high-speed Diesel engines drive the propellers through gearing with a reduction of about four to one. These ships will be some of the most remarkable yet built, and the engines installed comprise a couple of 3000 b. h. p., six-cylinder Augsburg four-cycle sets, which were manufactured for the express purpose of installing in submarine cruisers of over 3000 tons displacement. They run at 390 r. p. m., have a cylinder diam-

eter of 530 millimeters and a stroke of 530 millimeters. They represent the highest powered high-speed engines that have ever been built, but there is no great novelty in their design, since the cylinders are of exactly the same type as used for lower powered engines in which only six cylinders were employed.

There will thus be a total machinery power of 6000 b. h. p. in these ships, but presumably the engines will not be run at their maximum speed, in order that their life may be prolonged. The scheme is not one which would be proposed or recommended in the ordinary way, but the engines were available for immediate delivery and were, moreover, cheap, and if care is taken in the operation of the machinery, there is no reason why the vessels should not prove successful. The first ship is, it is stated, nearly completed at Hamburg and will shortly sail on her maiden voyage.

In other ways the Germans have made use of their war material and they have lately converted a couple of vessels originally built for torpedo boats into motor cargo carrying craft. These are comparatively small and do not appear to make very satisfactory cargo vessels, since, although 280 feet in length, they have only a deadweight of 1500 tons. A Sulzer 420 b. h. p. two-cycle engine is installed in each case.

DRYDOCK RATE WAR

A rate war among the dry-docking plants in the New York district was precipitated June 7 when James Shewan & Sons, operating ten dry docks, announced a reduction in rates from 16 cents a day a gross ton to 5 cents a day. The same afternoon the Todd Shipyards Corporation with a total of twenty-three drydocks represented among its four subsidiaries announced that its rates, effective June 7, would be 5 cents for the first day on each registered gross ton and 5 cents for the following lay days. The pre-war rates for drydocking ships were 12 cents a registered gross ton for the first day and 10 cents a registered gross ton for the succeeding lay days. During the past two years a number of smaller companies have sprung up and until the slump in shipping became so severe managed to keep pretty busy. It is believed that the smaller yards could not make expenses at 5 cents a ton, and that, if the rate war continued for a long while, it probably would result in breaking some of the plants, whose financial position is not as secure as the large yards.

WORK AT THE FLETCHER YARD

ONE of the quickest damage repair jobs that has recently been done in the East has been completed at the yard of W. & A. Fletcher Company, Hoboken, New Jersey, in the reconditioning of the amidship quarters of the steamship *Acropolis*.

The *Acropolis*, formerly the army transport *Kilpatrick*, was bought by Stephanidis, Benas & Company to run from New York to Constantinople. The Fletcher Company was awarded the work of reconditioning the vessel for this service. The work amounted to approximately \$100,000 and involved the installation of a second stack, steerage quarters and the necessary heating, ventilation and painting work for 700 emigrants and cabin and stateroom quarters for 100 passengers. There was also considerable work in connection with renewing shell plates on the hull and making engine, boiler and deck repairs. This work was completed at 4 o'clock on March 30 and that evening at about 8 o'clock the vessel caught fire and was seriously damaged.

Fletcher Given Contract

A survey of the fire damage was made by underwriters, and it was decided to place the work out on bids.

The work was awarded to the Fletcher Company, as its was the lowest bid and as the vessel had to sail from New York within fourteen days.

The Fletcher Company is rebuilding the steamship *Coppename* of the United Fruit Company. This large contract includes entirely new refrigeration installation, new blowers, coils, decks and a complete overhauling of the machinery, boiler and deck equipment. The stern is being built up and a deck house to accommodate the crew is being installed on the main deck. This vessel is a sister ship of the steamship *Saramacca* and the steamship *Surriname*, which have been rebuilt recently by the Fletcher Company.

The steamship *Pacific*, a Norwegian vessel, is having new gears and other minor voyage repair work done. Among the other vessels undergoing repairs are the steamship

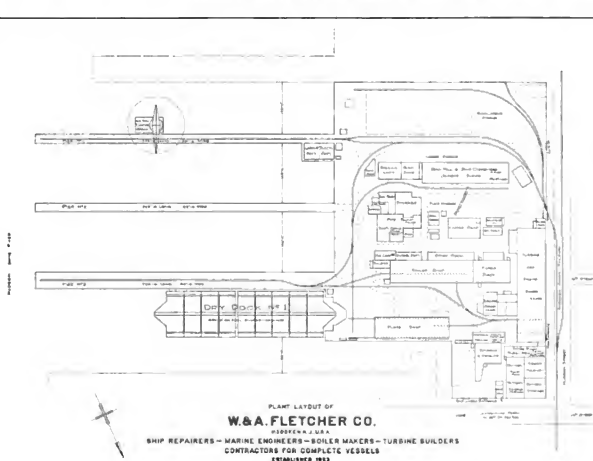
Clarksburg and steamship *Middlesex* of the United American Line, the steamship *Western Belle*, belonging to the J. W. Elwell Company, the steamship *West Hemtitte*, steamship *Huguenot* of the Shipping Board, etc.

The steamship *Henry D. Whiton* now being built by the Newburgh Shipyards, and the steamship *Lio* of the Baltimore Drydocks & Shipbuilding Company, are being equipped with Fletcher-Parson geared turbines.

Led in Engine Progress

Since 1853 the Fletcher Company has been closely associated with the development of the marine engine and is in no small measure responsible for the evolution of the present-day efficient installation. It is perhaps not too much to say that the company has done more than any other single shipyard or company to develop the crude steamboat of Fulton into the swift and reliable craft that ply the rivers, lakes and sounds of this country and the seven seas of the world.

The company has been identified with the production of more than





Pier No. 2 at the Hoboken yard of the W. & A. Fletcher Company

320 American-built vessels, including every type from harbor tugs to palatial turbine-driven steamers. Space does not permit of the detail list of the fleet which bears the Fletcher nameplate, but it may be of interest to mention a few of the various types of vessels that carry their nameplate:

Tugs: N. Y. C. Tug No. 3 and Tug No. 9.

Steamers: Washington Irving, Robert Fulton, Hendrick Hudson.

Steamships: Yale and Harvard.

Ferryboats: Eight West Shore ferryboats of West Point type. Lackawanna Railroad, Chatham, Montclair.

Yachts: Corsair, Isis, Intrepid.

Cargo steamers: Fresno, Pasadena, Provincetown, Herman Frasch, Steel Engineer, Tuxpanoil, etc.

Tankers: Bethelridge, Bidwell, Clement Smith, etc., etc.

First Turbine-Driven Vessel

In the course of the development of marine propulsion, the members of the Fletcher Company foresaw the adaptability and practicability of using the steam turbine as a means of driving steamships and in the year 1906 the company built and equipped the first turbine-driven ship built in America, the steamship Governor Cobb. In the following year the company built the Yale and Harvard, which hold the record of being the swift passenger and freight vessels engaged in commercial work in this country. The Yale and Harvard recently were reconditioned at Los Angeles for the Los Angeles-San Francisco service of the Los Angeles Steamship Company.

Along with the building of new ships, engines and boilers, the com-

pany has developed an excellent ship repair yard, which last year was rounded into completion by the installation of an 8500-ton floating drydock, 440 feet long on the keel blocks.

Reconditioned Minnesota

Some of the large work done by the company was the recondition-

ing and rebuilding of the steamship Kroonland, steamship Finland and steamship Minnesota of the International Mercantile Marine Company; the steamship El Sid, steamship El Rio and steamship El Siglo of the Southern Pacific. It may be of interest to note that in competition with other repair yards, the W. & A. Fletcher Company received on a competitive bid basis twenty-one out of the fifty-six vessels that were converted into United States Army transports, while eight was the largest number done by any other single yard or corporation.

The Fletcher Company was founded in the year 1853 and is now carried on under the leadership of Andrew Fletcher, president; H. N. Fletcher, vice-president, and Andrew Fletcher, Jr., secretary.

The Fletcher effort has safely carried the company through sixty-eight years of business and placed it in the front rank of shipbuilders and repairers, and no doubt its intimate knowledge of the business, coupled with sound judgment and initiative, will insure its preservation for generations to come.



One bay in the Machine Shop, W. & A. Fletcher Company

MARINE TURBINE OPERATION

By SEA FLAME

THAT the successful operation of turbine engines in a great degree depends on the proper handling and care of the main boilers would at first glance seem to be anomalous. However, a due consideration will go far to show that this assertion is based on good reason. The following article has been written to explain, in plain language, something about turbine engines as applied to the propulsion of steamers.

Nothing will be set down here regarding the scientific design and arrangement of the several blades, rotors and stators—only an attempt to explain somewhat the practical handling and care of these now almost universal prime motors. In brief, there are but two types of turbines: the impulse and the reaction, although there are modifications and combinations of both. Their care and handling are practically the same. As there are few direct connected turbines in merchant vessels, this kind will be briefly mentioned. In fact, their ills are identical with the geared type.

Dry Steam Necessary

Going back to the first sentence of this article, this is meant to show that a boiler giving pure dry steam is necessary for the best operation of turbines. Obviously, a carelessly handled or neglected boiler will not give out the kind of steam a turbine engine demands for its best work. So primarily a well handled boiler is of the utmost importance. This will be shown as we go on. As all engineers know, a turbine is simply one or more disks fastened to a shaft, with blades fixed at the outer edges, on which the steam impinges, and this steam, by its weight and velocity, causes the disk and shaft to rotate, and as only a part of the energy of the steam is taken in the first disk, stators, or fixed disks, with deflecting or reversing blades, direct the steam onto another moving disk, and so on down the different stages until the volume of the steam has become so attenuated and deprived of its weight that it is of no further practical use. In many types of turbines the disks are increased in diameter to allow for the increased speed and lighter weight of the steam. The same effect is at times gained by wider spacing or different pitch of blades as well as different curves and surfaces. Each turbine builder has his own methods, all of which have certain claims to economy. A full de-

During the war emergency shipbuilding program under the United States Shipping Board turbine propulsion for cargo steamers was featured to such an extent that the majority of the ocean going tonnage built during that period was turbine driven. This situation brought about a great deal of criticism of the geared turbine drive, which arose from the fact that there were so few engineers who had had any practical experience with this method of propulsion. Sea Flame in this article directs the attention of operating engineers to many seemingly unimportant details which are often overlooked or neglected in practice, to the detriment of economical operation and often to the ultimate breakdown of the turbine or gears. This article will bear careful study by all operators of turbines and especially by the younger engineers who are just beginning their experience at sea.

scription of the many different kinds would be far too long for a publication like Pacific Marine Review. There are many standard publications on the market which well explain the design and theoretical action of these machines. These publications, while of great good, do not appear to the writer to give any practical suggestions for operation. That is the intention of this article, and if it helps the engineer who does not fully understand the machine, the object it was written for will have been attained, and the labor not have been in vain.

These bladed disks and the several parts of the rotating unit are put into perfect balance, and should be dynamically and statically perfect so far as possible. Now comes the reason of such pure steam being called for. It is evident that if scale forming matter is in the steam from the boilers, it is very likely to coat the blades, and thus throw them out of balance to the detriment of good operation. Again, dirty boilers are liable to cause priming, and there is always danger to a turbine if heavy slugs of water come over, damage to blading in most cases being caused by this. And steam heavily saturated with water will never give as high vacuum as dry vapor, throwing also a strain on air pump and feed pumps, and in every way being a

source of danger and waste. So it is easily seen why a well operated boiler is a prime essential.

Clearances

All turbine builders furnish with their machines full instructions regarding clearances, together with tolerances which may safely be risked. These clearances may, during the first few weeks of operation, change slightly, but the changes need cause no worry, as they are, as regards axial or longitudinal clearances, due mostly to thrust bearings getting to a proper surface. It has been found that a first run of a thousand miles increased the clearance some five thousandths of an inch, and after that a further run of twenty thousand miles did not increase the clearance perceptibly. Tip clearance on blading in some types is to be watched carefully, as it is small. However, in most of the American types, this tip clearance need not be considered, as it is full enough to allow for much latitude. Longitudinal clearance is easily adjusted by the Kingsbury or other turbine thrusts provided.

The shaft bearings of turbines require attention to a closer degree than reciprocating engines, as an undue wear of one will throw the unit out of line and balance. However, the writer has run an ordinary freighter turbine for many days with the forward horsepower bearing down twenty-nine thousandths. While this was done to save delay, it is not advisable, although in this instance no damage resulted, particular attention being given to the special bearing, and its working carefully watched. A copious and constant lubrication must be given to the several bearings. When it is remembered that the surface velocity of a six-inch shaft at 3600 r. p. m. is about one mile a minute, the necessity of proper lubrication becomes apparent.

Air Leaks

Particular attention should also be given to little air leaks around the job. A very slight air leak will impair vacuum to a considerable degree, and as the highest efficiency of a turbine is dependent on the final pressure, a high vacuum should be kept. This also means saving in fuel, as it takes fuel to drive air pumps in an effort to overcome lack of good vacuum due to a lot of little leaks. So be careful in handling the several drain and other valves directly connected to the condenser and turbines. A few little leaks here and there soon mount up to consid-

erable of a total. These things are to be well looked after if economy is to be maintained.

The steam seals should also be intelligently manipulated. This seems to be a sort of gift to some engineers. Others, again, do not seem to grasp the fact that these steam seals need constant watching to ensure good operation. Should the main steam pressure change, even slightly, or the vacuum for some reason fall, it will be found that the steam seals require readjusting. However, with normal operation, steam and vacuum kept steady, steam dry and all in good balance, these seals will be of no trouble whatever. An over-seal is also to be avoided, as this means waste of steam, which in turn is loss of feed water, which again brings around the inevitable cycle of waste: more steam, more water, more feed, more fuel. That is the absolute result. Nature's law refuses to be mocked, and any waste of whatsoever character must be made up. So be careful of the leaks and steam seals around a turbine. This also might well apply to any engine or plant.

Co-operation

One source of loss of efficiency is caused by failure of the deck department to notify the engine room of any change in operation. Many masters give this subject due consideration. Others, again, appear to have the idea that when the engineer asks for notice that it is only a fad. The writer had the pleasure of sailing with one master who was exceedingly particular as regards notice to the engine room as to changes in speeds or stops. It was fine with him, for when we did get a bell without notice we knew that "something was doing," and prompt action necessary. To show owners what a difference in fuel will result from this co-operation, will say that about 100 barrels of fuel oil was saved in a forty-day round trip while the master in question was in command, and a change of masters increased consumption to an extent remarked upon by the superintendent, but "old custom" prevented action being taken. However, these days of needed and necessary saving will probably change this. No interference with the master need be made as regards safe navigation, but the throwing to "stop" of a bridge telegraph for every little incident while out in an unobstructed ocean looks unnecessary, and it is wasteful. This evil is more noticeable with coal fuel than with oil. Owners should instruct masters to help save.

Making Ready

Now we get down to making ready a turbine. In making ready for a run, get the main circulator and independent air pump going. Of course it is understood that jacking gear is out and all clear to move engines. See that all drains are open, and that steam seals show some vapor. Have lubricating oil system in action. Then crack throttle slightly, letting enough steam through to warm up the whole turbine slowly. It is better not to pull too high a vacuum at this time, as it prevents equal warming up, and is a waste. When the rotor casings become well warmed, the throttle may be opened a little more and the engine slowly moved. The propeller shaft need not make over five or six turns a minute. The writer finds that a cracking of the astern valves, when possible, will facilitate warming up, as a little steam through them does no harm, even with ahead valves open. As the engines warm up, the vacuum may be raised and all valves to drains, etc., closed as required. No particular time to cover this operation can be given, as this entirely depends on circumstances and should be governed by them. Good judgment is paramount. The condition of the turbines can be "felt" after experience in this work, and is one of the best guides to good results. When all is in order, the deck folks to be notified. If they do not move the engines soon, it is a good idea to keep enough steam flowing through the main engines to ensure them being kept warm. In some types this can be done by opening both the ahead and backing throttles slightly. In other styles, an alternate opening and closing can be done without moving the propeller, which in many cases is not desirable in unmooring, etc.

All being in shape, a start is made, and the several valves around the system properly adjusted to give the results required. Attention to lubricating system given, and things will begin to get to a proper balance. The same care must be exercised as regards the other units of the plant as would be observed in a reciprocating job. Should you get an astern bell, do not be afraid to give her the backing throttle promptly. It can do no harm. In fact, in stopping it is good practice to bring the rotor to rest by admission of steam to the backing turbines. After a good warming up do not be afraid to open up quickly. Of course in working to bells due attention must be given to gland steam, otherwise a rapidly falling vacuum will ensue, or, if

oversealed, a cloud of vapor from vents will take place.

Continuous Operation

In steady and continuous operation particular attention should be given to absolute tightness of the astern throttle valve. A leak at this point will cause a great loss, as the backing blades should revolve in as perfect a vacuum as possible when under way. In addition to the loss by reason of a leak, the efficiency of the engine is greatly reduced by the leaking steam retarding the backing rotor. This is obvious if given thought, and shows the great necessity for tight throttles. The same rule applies to the ahead throttle when going astern, as any slight leak will decrease the backing power, which at its best is one of the weak points of a turbine installation.

No absolute reliance can be placed on the ordinary type vacuum gauge. These instruments will vary at times most erratically, and for turbine work are not to be depended on at all. The writer finds that a good thermometer is more reliable, and it can be checked up easily. If the thermometer is placed in the exhaust trunk, and shows not more than 80 degrees Fahrenheit, you may be sure you have a vacuum of 28.5 inches. If everything is in good condition and the machine has been designed rightly, with enough condenser capacity, the temperature of exhaust should never be above 100 degrees Fahrenheit. A mercury column is all right if the ship does not roll, but is of no use in general sea practice.

Lubricating Oil

Another very vital matter to be attended to is keeping water out of the lubricating oil. In some types of turbines this is almost impossible, and a careful watch should be kept to ensure safety from this danger. A previous article has explained the best methods of effecting this object of clearing oil from water. It may not be out of order to repeat that either some good purifier or a system of settling tanks is of the utmost importance. To keep salt water out is easy. Always have the lubricating oil pressure somewhat higher than the salt cooling water pressure. But the water that creeps into the oil from glands, etc., is the worst and most difficult to deal with. Care, however, will do much, and the ever good advice of absolute cleanliness is to be followed in the operation of steam turbines. That and horse sense will accomplish much.

The engineer unfamiliar with turbines need have no worry as regards racing of engines. Unless most ab-

normal no trouble will be caused by this. Of course the gears will change their note, as will the turbines, but there is a big margin of safety in the fluctuation of speeds with that type—much more than in a reciprocating job. Ordinary judgment will go far in determining to what extent it is advisable to let her run open full in a sea way. This cannot be set down as a hard and fast rule,

as conditions vary with ships as with men. A good mechanic can feel the plant.

Finally, do not become careless over the continued good operation of a turbine. When an engine of this kind "blows up" she does it quickly, and with no notice. Eternal vigilance is the price of safety. Keep boilers clean; plenty of clean

lubricating oil on bearings; tight joints and a good vacuum, and turbine trouble will be reduced to a minimum. And above all, do not open 'em up to see what makes 'em tick. Occasional surveys are of course necessary, but continually lifting bearing caps or opening casings is not advisable, as there is always a liability of dirt getting in.



Artist's drawing showing one of the new United States battle cruisers. These ships are to be of 43,500 tons displacement, 674 feet in length, and are to be driven by steam turbine electric propulsion at a speed of 33 knots, the turbines developing 180,000 S. H. P. Eight 16-inch guns will compose the main battery.

JAPAN ADOPTS ELECTRIC DRIVE

New York Shipbuilding Company Gets Contract For Nippon Navy Collier

JAPAN is to be the second nation to use the electric drive in its navy, a contract having just been closed with the New York Shipbuilding Company of Camden, New Jersey, for a 20,000-ton fuel ship similar in size to the U. S. collier Jupiter, recently renamed the Langley.

Interested in the success of the electric drive, proven by the ten years' service of the Jupiter and the two years or more of practical service of the U. S. S. New Mexico, the world's first electrically propelled battleship, Japan has decided to follow America's steps in first electrifying a smaller navy ship. There is no doubt that if this vessel operates successfully, future large ships of the Japanese navy will be electrically propelled.

It was through the untiring efforts of Captain M. Yokura that the Japanese government decided to introduce the electric drive in its navy. Economy in fuel is of paramount importance and Captain Yokura therefore decided to install electrically-driven auxiliaries throughout, as well as to equip the boilers with superheaters so as to obtain about 200 degrees Fahrenheit of superheat. This last mentioned improvement alone will mean a saving of at least 10 per cent in fuel.

The G-E equipment, purchased from the International General Electric Company, will consist of an 8000 horsepower turbine generator supplying power to two 4000 horsepower, 120 revolutions per minute, synchronous motors; also two 500 kilowatt direct current turbine sets, one of which is to be sufficiently large to furnish the exciting current

for the main generating units, as well as power to drive all the auxiliaries, such as the blower motor, steering gear, the gypsy, radio apparatus, refrigerating plant, laundry and lighting equipment.

There is also furnished a 650 kilowatt alternator which can be connected by means of a coupling to either of the 500 kilowatt, direct current auxiliary turbines, so that, in case of failure of the main driving unit, or any of its auxiliaries, this small generator will give sufficient power to propel the vessel at about $7\frac{1}{2}$ knots.

This Japanese fuel ship will be completed in twelve months' time, and no doubt will on her trials make a record in fuel economy because of her water tube boilers of 270 pounds pressure with 200 degrees Fahrenheit of superheat, the fact that synchronous motors are to be used for the main drive, and that all auxiliaries are to be electrically operated.

BETHLEHEM DELIVERS TANKERS

Sparrows Point Plant Completes Two Fine Vessels For British Oil Company



Tank steamer Henry Deutsch De La Meurthe, 8350 d. w. t., built at the Sparrows Point plant of the Bethlehem Shipbuilding Corporation for the Lux Navigation Company of London, England

FOLLOWING a very successful deep-sea trial run on May 20, the second of two steel tankers built at the Sparrows Point plant (Baltimore, Maryland) of the Bethlehem Shipbuilding Corporation, Ltd., for the Lux Navigation Company, London, England, has been delivered to her owners. The first one of these tankers to be built was delivered on May 10, 1921. These vessels, the steamship Henry Deutsch De La Meurthe and the steamship Emile Deutsch De La Meurthe, are similar in design to the well-known "Shell" tankers, and are built on the longitudinal system of framing. They are classed at Lloyd's highest rating. The total carrying capacity of each of these tankers is 8350 tons deadweight on a mean draft of 24 feet 9 inches, with an oil cargo capacity of about 7600 tons. The principal particulars of the vessels are as follows:

Length over-all	428' 0"
Length bet. perpendiculars.....	412' 0"
Extreme breadth	53' 3 1/2"
Molded breadth	53' 1"
Molded depth to upper deck.....	31' 0"
Molded depth to main deck.....	24' 0"
Speed, knots per hour	11
Type of engine.....	reciprocating
Size of engine, stroke.....	27x45x75x48"
Boilers	Scotch
Number of boilers	3
Steam pressure, pounds.....	180
Kind of fuel.....	oil and coal

The Bethlehem (Dahl) mechanical oil-burning system is installed on each vessel, and the boilers are fitted with Howden force draft furnace fronts suitable for conversion to coal burning if desired. Engines and boilers are placed aft with the fuel oil tanks forward of the boilers. Bethlehem-Weir horizontal fuel oil pressure pumps, 6 inches by 4 inches by 8 inches, are installed in duplicate for supplying oil to the burners. The

pump room is located near midship, and is approximately 8 feet long and of the same width as the vessel.

Two Bethlehem-Weir vertical simplex cargo pumps, 18-inch by 16-inch by 24-inch stroke, are utilized for handling the oil cargo on each ship. Feed, drain, fuel oil transfer, ballast and deck and donkey and fire pumps are the same type. The main circulating pump is a 14-inch double suction centrifugal type, direct connected to an 8-inch by 8-inch vertical single steam engine. The deck machinery for each vessel consists of two 8 1/4-inch by 8-inch gypsies located on the upper deck, a hand-operated capstan on the forecable deck, two 8 1/4-inch by 10-inch compound geared winches on the upper deck, a 10-inch by 10-inch triple spur

geared windlass, and a 9-inch by 9-inch horizontal spring-quadrant steering gear controlled by hydraulic telemotor. The auxiliary machinery was built at the Moore plant of the Bethlehem Shipbuilding Corporation, Ltd.

The results of the deep-sea trials of these two vessels were unusually satisfactory. On the trial of the steamship Henry Deutsch De La Meurthe, which was run April 21, an average speed of 12.90 knots per hour was maintained at a mean draft of 24 feet 9 inches. An average of 2833 indicated horsepower was developed at an average engine speed of 79.34 r. p. m.

On the trial of the steamship Emile Deutsch De La Meurthe, which was run on May 20, the average speed per hour maintained was 12.36 knots at a mean draft of 24 feet 10 inches. An average indicated horsepower of 2985 was developed at an average engine speed of 79.25 r. p. m. During the trials of both vessels the fuel burned was oil with a gravity of 28 degrees Baume.

OFFICES MOVED

The International Pulverized Fuel Corporation announces that on and after April 20 its general offices will be located in the National City building, 17 East Forty-second street, New York City.

ELECTRIC FURNACE IN SPAIN

The Electric Furnace Construction Company, Philadelphia, announces that the ten-ton Greaves-Etchells electric furnace installed by the English office at the works of the Sociedad Espanola de Construcion Naval, Spain, has been successfully started. This is the first large electric furnace to be operated in Spain.



Bow view of the Hawkeye State at a San Francisco wharf. This splendid passenger liner was built at Sparrows Point.

EUROPEAN MARINE NOTES

Exclusive Correspondence Pacific Marine Review

THE shipping position on this side of the Atlantic is still one of depression, although here and there, owing to special circumstances, freights have moved higher. At the same time shipowners have been putting their house in order. They have set to work to reduce running costs. Tremendous savings have already been effected in connection with stores and equipment. With regard to wages a friendly settlement has been arrived at with every section of shipboard workers except one and that one is the Cooks' and Stewards' Union. From the firemen and deck hands up to the commanding officers, reductions have been agreed to by all except the cooks and stewards. The smallest cut, of course, is in wages of the sailors and firemen—ten dollars a month. This, however, with the 48 per cent drop in the cost of living, still leaves them better off than they were before the war. The cooks and stewards are trying the effect of withdrawing their labor. In other words, they have struck. Just what is happening on the cargo boats is not clear, but certainly, in so far as regards big passenger liners, the strike is a failure. Volunteer and non-union cooks and stewards have been obtained in abundance, and in fact more offers of help were received than could be accepted.

Importers and Exporters

A report, including a summary of the proceedings at a council meeting of the Manchester Association of Importers and Exporters, shows that this body closely follows all matters affecting the corporate concerns of merchants, and is kept well informed of current developments. Among the matters discussed at the last meeting were clauses in bills of lading, the recent report of the Imperial Shipping Committee, and the problem of pilferage. Dealing with the recommendations of the Imperial Shipping Committee that uniform legislation should be adopted throughout the Empire on the lines of the existing acts in the United States, Canada, Australia and New Zealand, the following summary is given of the effect of the existing legislation:

The governing terms are to the effect that the owners must not be relieved from liability for loss or damage arising from negligence, fault or failure in the proper loading, stowage, custody, care or delivery of goods received by them to be

carried in or by the ships, nor must the obligations of the shipowner or his servants to handle and stow the goods carefully, and to care for, preserve and properly deliver them, be lessened, weakened or avoided.

It is recalled that the Council and Joint Indian Bill of Lading Committee of the Manchester Association sent recommendations to the government that legislation on the lines of the report of the Imperial Shipping Committee should be introduced without delay. In another part of its report the Manchester Association, referring to an interim statement on pilferage issued by the Chamber of Shipping, writes that "it would appear from this that many claims for pilferage have been settled by shipowners, notwithstanding the restrictive clauses in bills of lading." This of course expresses the facts and it bears out the point that clauses in bills of lading give shipping managers certain powers which, in fact, are rarely, if ever, exercised. Some of them, such as the provisions relating to deviation, are inserted for the purpose of meeting certain contingencies which, it is hoped, in the interests of all, will not arise.

The New Cunarder

It is nearly ten years since Swan, Hunter & Wigham Richardson, Ltd., launched a Laconia, sister ship to the Franconia, for the Cunard Steamship Company, Ltd. Unfortunately, both these fine ships were lost during the war. The new Laconia, now being built, is of much the same length as her predecessor, but has a greater breadth and is to be driven by steam turbines in the place of reciprocating engines. The leading dimensions of the Laconia are: 623 feet 9 inches extreme length, 73½ feet molded breadth, and 45 feet in depth to the shelter deck. The gross tonnage will be about 21,000 and her sea speed 16 knots. The ship is being built to Lloyd's highest class. She has a straight stem and elliptical stern, and will be provided with two pole masts and one funnel. Very comfortable accommodation will be provided for about 340 first-class and 340 second-class passengers. The public rooms for the first-passengers will consist of a spacious lounge, smoke room and drawing room, a dining room, garden lounges and a gymnasium. In the second-class accommodation there will be a dining room, smoke room, verandah cafe and a drawing room. Accommodation will also be provided for 1500 third-class passengers, and they

too will have a dining room, a general social room and smoke room. The captain will be provided with a most comfortable suite of apartments communicating with the navigating bridge. There will be separate smoke rooms for the officers and engineers. For all the passengers there will be ample provision of baths, lavatories, etc., as well as hospitals, a dispensary and an operating room. The galley, pantries, baker's shop and refrigerated store rooms for perishable provisions will all be most complete. The outfit of boats and life-saving apparatus will all be in accordance with the British and American authorities and to the requirements of the International Convention for a passenger steamship.

The Laconia's twin-screws will be driven by two sets of turbines of the impulse type and working with double-reduction gearing, the steam being superheated. The total shaft horsepower will be close on 13,000, with the propellers running at 90 revolutions per minute. On each of two lines of shafting there are three turbines working in series. When going ahead the whole of the three turbines work in series, while for going astern there are two turbines working in series and incorporated respectively with the intermediate and low-pressure turbines, which arrangement has the great advantage of economizing steam and minimizing the risk of total breakdown. In case of any accident to one or other of the turbines, emergency connections are provided which can readily be brought into use to enable the remaining turbines to be worked. The whole of the auxiliary machinery in the engine room is of approved modern types and the installation is most complete. There will be put into the ship three double-ended and three single-ended tubular boilers to be fired with oil fuel on the Wallsend-Howden system and working at 220 pounds per square inch under forced draft.

Australia's Fleet of Liners

Another stage in the progress of the shipping plans of the Australian government is marked by the launch of the Moreton Bay at the naval construction works of Messrs. Vickers. The vessel is one of five that are under construction in this country for the Commonwealth government line of steamers, two sister vessels, the Jarvis Bay and the Hobson's Bay, being on the stocks here, while two, the Larga Bay and the Esperance

Bay, are being built by Beardmore & Company at Dalmuir. The Moreton Bay has overall length of 548 feet 9 inches, and with a load displacement of 22,500 tons designed to carry 12,000 tons deadweight. Her engines will consist of two sets of double reduction geared Parsons turbines. A large proportion of the cargo space will be isolated for cold storage.

There will be accommodation for about 700 third-class passengers in two-, four- and six-berth cabins and there will be special suites for twelve first-class passengers. Special consideration has been given to the crew, who are housed in well-ventilated cabins under the forecabin deck. The lifeboats are of sufficient capacity to take the whole complement of the ship, and include two 30-foot motor launches. These are equipped with wireless telegraph installations, and in case of emergency are capable of towing all the ordinary life-boats. Mr. H. B. G. Larkin, the general manager of the Commonwealth line, said that he hoped by the end of this year to inaugurate with these five ships a regular four-weekly service between this country and Australia.

Lloyd's Shipbuilding Returns

There are some very striking lessons to be learned from the newest shipbuilding figures published. The shipbuilding returns of Lloyd's Register of Shipbuilding for the quarter ending with March show that, taking into account only vessels of 100 tons gross and upwards, the construction of which has actually been commenced, there were 884 merchant vessels of 3,798,593 tons building in the United Kingdom on March 31, as compared with 921 vessels of 3,708,916 tons three months earlier and 865 vessels of 3,394,425 tons twelve months earlier. The total was therefore about 90,000 tons more than that on hand at the close of September of last year and about 404,000 tons more than that at the close of March of last year. Of the total 790 vessels of 3,528,190 tons were steel steamers and four vessels of 2174 tons wood and composite steamers; 60 steel vessels of 260,731 tons, four ferro-concrete vessels of 2094 tons, and two wood and composite vessels of 355 tons were motor vessels; 23 of 4749 tons were steel sailing vessels, and one vessel of 300 tons was a wood sailing vessel. The total includes 84 steamers and motor vessels of 1000 tons and over, aggregating 557,027 tons, intended to carry oil in bulk.

Work Suspended

It is pointed out, however, that the

figures do not represent the work actually in progress. In normal times the total would indicate great activity and prosperity in the shipbuilding industry, but the times are not normal, and the total as it stands is misleading, because it does not represent the work actually in progress, and therefore does not afford a true index to the relative position of the shipbuilding industry as compared with, say, twelve months ago. It includes a considerable amount of tonnage on which work has been suspended owing to the very heavy reduction in shipping values, corresponding to the rapid and serious fall in freights and consequent decline in the demand for tonnage. It also includes a large quantity of tonnage the completion of which has been postponed, owing, principally, to the joiners' strike. The tonnage on which work has been suspended amounts to 497,000 tons, and the tonnage the completion of which has been delayed amounts to 350,000 tons. These two totals, amounting to 847,000 tons, must therefore be deducted from the tonnage under construction in order to enable a comparison to be made with the figures for normal times, and there is thus reached a reduced total of 2,951,593 tons under construction in the United Kingdom.

Types and Destinations

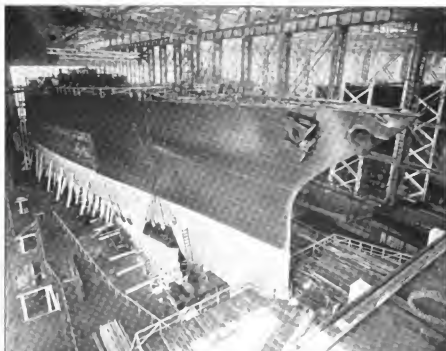
Of the vessels one was between 25,000 tons and 30,000 tons in size, 5 were between 20,000 and 25,000 tons, 25 were between 15,000 and 20,000 tons, 28 were between 12,000

and 15,000 tons, 4 were between 10,000 and 12,000 tons, 63 were between 8000 and 10,000 tons, 126 were between 6000 and 8000 tons, 94 were between 5000 and 6000 tons, 53 were between 4000 and 5000 tons, 72 were between 3000 and 4000 tons, 77 were between 2000 and 3000 tons, 92 were between 1000 and 2000 tons, 107 were between 500 and 1000 tons, and 137 were between 100 and 500 tons. All the sailing vessels were under 500 tons.

Of the total under construction in the United Kingdom, 58 vessels of 295,298 tons were for France, 71 of 241,381 tons for Norway, 26 of 210,708 tons for Holland, 18 of 97,720 tons for British dominions, 5 of 64,390 tons for Italy, 15 of 46,600 tons for Spain, 5 of 28,411 tons for the United States, 11 of 27,545 tons for South America, 7 of 25,775 tons for Denmark, 4 of 25,200 tons for Japan, 7 of 23,230 tons for Greece, 5 of 17,060 tons for Belgium, 2 of 10,340 tons for Sweden, and 2 of 4750 tons for other countries.

Cunard's Smaller Profits

Far smaller figures are contained in the Cunard report for 1920 than those for 1919, which is only natural in view of the severe shipping depression which set in last year. After provision has been made for income tax, corporation profits tax, debenture interest and depreciation of ships, other properties and plant, and including £144,100 brought forward, there remains at the credit of profit and loss £638,200.



Copyright by New York Shipbuilding Corp.

United States battleship Colorado taken at the New York Shipbuilding Company's plant, Camden, New Jersey, just before launching

GOVERNMENT SHIPBUILDING IN AUSTRALIA

By TRADE COMMISSIONER A. W. FERRIN, Melbourne
(Reprinted from Commerce Reports)

THE recent announcement by the minister in charge of shipbuilding that lack of funds (the current year's appropriation having been exhausted in eight months) would prevent the building of any further Commonwealth government ships at the dockyard of New South Wales State government on Walsh Island, and the Labor party agitations which have followed the dismissal of large numbers of men from that plant and also from the Commonwealth government dockyard at Cockatoo Island, have renewed public interest in the question whether the Commonwealth government shall or shall not continue to build and operate its own vessels.

Opposition to continued government construction of ships comes from the organizers of the so-called "economy movement," a non-partisan agitation which seeks the reduction of all government expenditures on the ground that the combined Commonwealth and state debts of over £800,000,000 (\$3,893,000,000) is too heavy a burden to allow of any increase, even for productive enterprises such as ships.

The Commonwealth Government Fleet

The Commonwealth government fleet was begun in 1916 by the purchase by the prime minister of fifteen steel cargo vessels of an average deadweight capacity of about 7000 tons and two wooden vessels, one of which was subsequently wrecked and the other sold. Lack of normal private shipping facilities and abnormal freight rates due to war conditions were the reasons for acquiring this fleet.

It was subsequently decided to increase the fleet by building in Australia twenty-one steel and twenty-four wooden steamers, in England five steel steamers, and in America fourteen wooden ships. Fourteen wooden ships were built in the United States, but were not satisfactory and were sold to American interests. Payment on five of them was defaulted by the buyers, and the Commonwealth had to take them. They are now running on the Australian coast. Contracts for twenty-two of the twenty-four wooden ships to have been built in Australia were canceled.

The steel cargo ship program was divided into two parts, the first consisting of six sister ships of a deadweight capacity of about 6000 tons, each 331 feet long by 48 feet beam, with single-screw engines and Bab-

cock & Wilcox boilers, giving an indicated horsepower of 2200 and a loaded speed of $10\frac{1}{2}$ knots. The last of these vessels was completed in 1920 and all are now in commission.

Progress of Second Series

The second part of the program consists of fifteen vessels, of which three were to be built at Williamstown, three at Walsh Island, one at Cockatoo Island, four at a private yard in Queensland, and four at a private yard in South Australia. Two of the Walsh Island boats have been launched. It is now intended to drop the other boat to have been built at Walsh Island, making the total number of Australian-built steamers twenty instead of twenty-one. One of the second set of vessels has been launched at Williamstown and one at Cockatoo Island, and work is progressing on eight more. The vessels of the second

series already launched and nearing completion, and the others under construction are of the Isherwood shelter-deck type, 331 feet long by 48 feet beam, carrying 6000 tons deadweight on a 23.7-foot draft. Their engines, etc., will be the same type as those of the first series vessels.

The minister in charge of shipbuilding stated on March 19 that it was hoped that arrangements would soon be consummated by which the construction of two 12,000-ton steel steamers would be resumed at Cockatoo Island. These will be equipped for oil fuel and will have a loaded speed of 13 knots; they will be 530 feet long by 63 feet beam and with a loaded draft of 29.75 feet. In addition to the Commonwealth-built ships three 12,000-ton ships are building for the government at Vickers' in England, and two at Beardmore's in England.

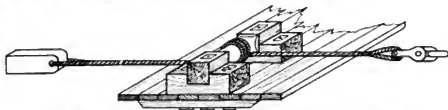


Diagram showing new snubbing device in use at the launching ways of the Union Construction Company, Oakland, California

New Snubbing Device

A NEW feature recently used at the launching of a ship is a snubbing device or brake, developed by J. G. Sjöberg, hull superintendent of the Union Construction Company, Oakland, and successfully applied at the company's last launching. The device, of which two are required, and which is clearly shown in the accompanying sketch, consists of a heavy line, one end of which is attached to the drag chains. The line is given three or four turns around a cylindrical wooden block or drum fastened to the building slip, and then stretched along the slip for 80 or 100 feet. The end of the line farthest from the drum is then attached to a drag heavy enough to obtain the necessary tension on the line and create the friction or braking effect on the drum.

When the ship leaves the launching ways, the drag chain moves with the ship and pulls on the line, which is wrapped around the drum and held to its work by the drag. The drag is attached by a small line which breaks when the drag has

traveled the distance allowed and has come in contact with the stops attached to the drum, thus releasing the heavy line, which goes out with the ship.

To persons familiar with the handling of ships, it can readily be seen how great a braking power can be obtained by this method, because the friction brought into action by winding a line around a post or drum is limited only by the strength of the materials used and the tightness of the coils.

The ship to which the device was applied was heavier than similar ships at the time of launching, but she stopped in a shorter space, which demonstrated the success of the device herein described.

This device, in connection with the Sjöberg launching trigger, has enabled the Union Construction Company to be particularly successful with their launchings, and illustrates the policy of the company to make use of all new ideas suggested by men in the yard and proved to be practical in the saving of time, labor or material.

SHIPBUILDING AT BALBOA

A Description of the Drydock and Shops of the Panama Canal

THE shops and drydock at Balboa at the Pacific entrance to the Panama Canal were designed as permanent adjuncts to take care of all repairs to the Canal plant, including floating equipment and the rolling stock of the Panama Railroad, to serve the United States Navy as a repair base for the fleet, and to handle current and emergency repairs for the thousands of merchant ships that pass through the Canal each year.

The Drydock

The drydock has the same dimensions as the Canal locks, and is of the same reinforced concrete construction. It is 1000 feet long, 110 feet wide, and the depth of water over the keel blocks is 45 feet. It can accommodate the largest ships afloat; and has been used for docking such vessels as the ex-German liner Von Steuben, the battleship New Mexico, and the Chilean dreadnought Almirante Latorre.

The pumping plant consists of four electrically driven main pumps (Worthington Volute) of 1000 horsepower with a capacity of 15,000 cubic feet per minute each, and two drainage pumps of 200 horsepower each. With three pumps, which is the normal method of operation, the dock can be pumped dry in 2 hours 15 minutes. To flood it requires approximately 30 minutes. The dock is closed with miter gates, which are electrically operated, instead of a caisson as used in most graving docks of similar type; and it is estimated that this feature cuts 40 minutes from the time required to dock a ship. There are 11 electric capstans, distributed along the sides and approach walls, that are used to work vessels into and out of the dock. A traveling crane moving on



Traveling locomotive crane at Drydock No. 1, Balboa. Capacity 50 tons.

tracks encircling the dock has a capacity of 50 tons at a radius of 87 feet.

Shop Reservation

The shops cover an area of approximately 60 acres, adjoining the drydock on one side and on the other a steel and concrete repair wharf 60 feet wide and 2663 feet long, with a depth of water alongside of from 28 to 44 feet at mean sea level. At the end of the shop reservation there are 290 feet of additional wharfage. On the shore side the shops are connected by tracks with the main system of the Panama Railroad. There are forty-four permanent buildings of steel and concrete construction in the shop reservation. These include a general office building, a machine erecting and tool shop, forge shop, boiler and shipfitters' shop, steel sto-

rage shed, general storehouse, paint shop, car shop, planing mill, electrical and instrument repair shop, lumber and equipment shed, pattern storage building, foundry, coke shed, boiler house, roundhouse, gas house, paint house, sand house, compressor plant and pump wells, oil houses, restaurant and lavatories.

Shop Equipment

The plant is equipped with the most modern tools and appliances. These include a lathe with a 14-foot swing and 65 feet between centers, an extension open-side planer (96 inches by 132 inches by 24 feet), a 16-foot vertical boring mill, a 500-ton forging press, a 30-foot plate roll, and a 30-foot plate planer. The foundry can produce iron castings up to 20 tons, steel castings up to 5 tons, and bronze castings up to 2½ tons. The planing mill can provide material for any marine job involving the use of wood. In this department a great deal of native timber has been handled with excellent results. For many purposes it has been found cheaper than imported lumber and more durable. All of the shops are equipped with overhead traveling cranes of from 10 to 60 tons capacity. A sufficient stock of plates, angle irons and structural shapes commonly used in shipbuilding is carried to take care of any ordinary repair job without delays for material.

Electric power is used throughout, furnished by the hydro-electric plant at the Gatun spillway.

Working Force

The forge employed is normally about 2300 men, of whom 800 are skilled American mechanics and 1500 West Indians and other alien helpers and laborers with local training.

Character of Business

During the fiscal year 1920, the last annual period for which complete figures are readily available, the value of work performed at the Balboa shops and at the smaller shops at Cristobal was \$6,454,219, of which 59.87 per cent was marine work, 19.73 per cent railroad work, 12.17 per cent miscellaneous, and 8.23 manufacturing. Of the total work performed 35.09 per cent was for the Canal, 43.38 per cent for individuals and companies, 17.16 per cent for the Panama Railroad, and 4.37 per cent for government departments. At the Balboa drydock 16 vessels were docked for the United States Army and Navy, 33 for the Panama Canal, and 34 for outside commercial interests. The total number of vessels other than tugs, barges and dredges on which work was done at Balboa was 422.

Rebuilding of S. S. Marne

The largest job recently handled



View of Balboa, Canal Zone, from the top of Ancon Hill, showing administration buildings, shops and docks.



Sketch map of the Pacific Terminal of the Panama Canal showing the location of the coaling plant, drydock and shops at Balboa

at Balboa, and one which illustrates the capacity of the shops, was the rebuilding of the American steamship *Marne*, a freighter of 6869 gross and 4885 net tons belonging to the United States Shipping Board. On January 24, 1920, the *Marne*, while lying at a dock at Cristobal, took fire after an explosion in the hold. Her cargo included 160,000 cases of gasoline and benzine. The ship was towed away from the dock and sunk in shallow water by gun fire from a submarine. Fifty-four shots were fired from three-inch guns. The fire continued to burn, and was not finally extinguished until ten days later. The ship was subsequently raised, but before the cargo could be taken out a second explosion and fire occurred on March 6, 1920, and it was necessary to sink her again in 40 feet of water. The *Marne* was then raised a second time, and towed through the Canal to the Balboa shops, arriving there early in July. As a result of the two explosions, fire in the cargo and the damage by gunfire, the ship was a thorough wreck. As a preliminary to repairs it was completely stripped until only the bare hull remained. Later the deck and shell plates were removed over large sections, so far as could be done without danger of springing the ship. The main turbine and all auxiliary machinery were removed. Fortunately no holes were shot through the boilers, so that it was not necessary to take them out of the ship. Approximately 35 per cent of the shell plates were removed during the course of repairs, and about 10 per cent of those removed were renewed. The remainder were rolled out and replaced. The shelter deck, while badly warped, required the renewal of only four

or five plates, the balance being successfully rolled. In some instances where plates were perforated by shell holes, and the plate itself, except for this damage, in good condition, the acetylene process of welding was used, blanks being welded through the holes after they had been trimmed off to an approximate circle. No especial difficulties were encountered that could not be easily handled by the facilities of the Balboa shops. The repairs were completed in seven months, and when the ship was returned to the Shipping Board, she was as strong and seaworthy as when first launched.

Other Notable Jobs

The *Marne* is the seventh large vessel to be rebuilt at the Balboa shops, the others having been the American steamship *Cristobal* of 9000 tons gross and five former German liners interned in Peru at the outbreak of the war.

Heavy repairs have also been made during the current fiscal year

to the American steamship *General H. F. Hodges*, the Japanese steamship *Koyo Maru*, which grounded June 20, 1920, on Serrana Bank, 300 miles northwest of Colon; the British steamship *Sussex*, which ran on the breakwater at the Atlantic entrance to the Canal January 3, 1921, and the British steamship *Tregantle*, which was aground March 25, 1921, on Macabe Island off the coast of Peru.

Charges

The Panama Canal is not prepared to do repair work on a contract basis; but preliminary estimates can be furnished; and at the present time repairs are made at cost without any charge for the use of the permanent plant. The wages paid American skilled mechanics on the Isthmus are higher by 25 per cent than current wages in the same trades in the United States, but the wages of West Indians and other alien helpers and laborers are much lower. These differences tend to offset one another. Constant effort is made to reduce costs to a minimum and to maintain an organization capable of prompt, efficient and reasonable service to all vessels using the Canal or its terminal ports.

The charges for the use of the Balboa drydock by merchant ships are: for docking and undocking and the use of the dock for 24 hours, 25 cents, and for each subsequent lay day, 15 cents per gross ton, Panama Canal measurement. The docking rules are published in detail in the pamphlet entitled "Schedule of Rates for Supplies and Services Furnished to Shipping," which will be supplied gratis on application to the Panama Canal, Washington, D. C.

In addition to the facilities at Balboa, the Panama Canal maintains at the Atlantic entrance to the Canal a smaller drydock, 49.95 feet wide at the entrance, 300 feet long, and with a depth over the blocks at mean sea level of 13.39 feet, and shops less elaborately equipped than those at Balboa, but capable of handling all ordinary marine repair work, and doing a large annual business.



An interesting night view of the interior of the boiler shop at Balboa

MARINE INSURANCE

(CHARLES F. HOWELL, Eastern Contributing Editor)

A Campaign Needed

A shipping man discloses a somewhat unexpected condition. Considerable misunderstanding (and profanity) is being produced by general average in the intercoastal trade, says he, because of shippers' ignorance of customs of the sea. Evidently, many men, accustomed to transportation by rail and the practically complete liability of the carrier, ship by steamship, without stopping to inquire as to the degree of protection offered their goods in transit. Consequently, shipments often go forward uninsured. In the event of general average, the shipper finds himself facing an unexpected charge, and if reports are true, some Pacific Coast traffic managers have got into hot water quite recently when their principals inquired why such charges had to be paid.

Individuals and companies doing purely a domestic business may be pardoned, of course, for their ignorance of marine insurance. Up to the resumption of intercoastal trade last year, practically all business between the Atlantic and Pacific was overland. Unless a company had been engaged in coastwise or foreign trade, therefore, marine insurance had not been necessary. But steamship and marine insurance companies do bear a large responsibility for the continuance of such misunderstandings. Intercoastal freight solicitors would be helping themselves in the long run if they took pains to make clear the precise degree of the carrier's responsibility, because a man who pays an unexpected general average (which he might have protected by insurance) is scarcely a promising prospect for additional business. Underwriters, too, might make a studied effort to inform the public, beginning with fundamentals. Persons who are engaged in such highly specialized business as shipping and marine insurance do not appreciate how ignorant the public is of the simplest and most commonplace details. This ignorance, as was pointed out, is quite to be expected of men who have shipped altogether by rail and therefore have not faced the necessity of familiarizing themselves with ocean transportation. In the absence of the inclusion of marine insurance in quoted intercoastal rates, which, although it would offer a close paral-

lel to railroad rates, nevertheless would be attended with considerable confusion, the only solution appears to be a comprehensive campaign for the dissemination of information. It would pay well in the end.

The Pacific Market

Marine insurance on the Pacific Coast is not at all in a satisfactory condition. The depression of shipping and the consequent tying-up of vessels and the falling-off in receipts of operators have reacted immediately upon underwriters, whose net premiums in many cases are very small compared to those of a year or two ago. One underwriter said that the company that was able to show a profit on the year's writing would have good cause to consider itself fortunate.

The situation is made more grave by some heavy losses. The sinking of the Governor was a hard blow, although most of the hull had been placed in New York and London. On top of that loss came the burning of the Japanese steamship Tokuyo Maru of the T. K. K. Her hull was placed in Japan, of course, but the cargo alone cost American underwriters close to \$700,000, the one item of nitrate being a quarter of a million. Besides these larger losses, the intercoastal trade, in which most of today's cargo is moving, has been subject to a number of mishaps.

But underwriters can pay losses if they receive sufficient premiums. If they do not receive premiums their situation is likely to be bad. And premiums are not being paid as they should be, although a surprising number of vessels are being covered against total loss only and the valuations of many have been reduced considerably, a number of schooners having dropped from \$175,000 and \$200,000 to \$100,000 and \$110,000. When an operator is hard pressed for cash he is inclined to proffer a note for premiums. These notes have been accepted by underwriters, but they now are experiencing great difficulty in making collections. In fact, practically all policies being issued on the Pacific contain clauses providing for cancellation in the event of non-payment of premiums.

These reduced valuations, mentioned above, may be no more than the replacement cost of a vessel would be today and they probably

exceed market prices; but it can be seen readily that any considerable loss of vessels thus reduced would be disastrous to the operating companies that have had no opportunity to write off any large portion of the capital charges. Total loss only also is playing with fire. But when the operator cannot get freight, even at ruinous rates, he must reduce expenses even though the reduction be dangerous.

The views presented above are substantially those of one underwriter. It should be said, however, that not all see the situation so unfavorably. Another expressed surprise at the number of reported failures of operators to meet their notes, and as for cancellations, he said that his company had had a sixty-day clause for years. It is a fact, however, that the San Francisco market recently has added the following: "In event of non-payment of premium sixty days after attachment, this policy may be cancelled by the assurers upon five days' written notice being given the assured." This clause is identical with that of the syndicate policies except for the substitution of "sixty" days for "thirty," the time allowed by the syndicate. The latter has been endeavoring to enforce the thirty-day provision rigidly, but even it has failed in some instances.

Some underwriters believe that they detect a slight improvement in the cargo market. Japan is improving, but the improvement is not nearly so marked as was hoped a year ago. Moreover, there is too much direct trade between the Atlantic and Far East for the Pacific Coast to benefit greatly from Oriental business.

Low Ebb in Japan

Much the same story of a low ebb comes from Japan. Says the Japan Advertiser of Tokyo:

"In spite of the fact that risks for ships built during the war are greater than those built before the war, the premiums for the former are lower. Formerly 4 per cent was quoted for European or American service, and 3 per cent for near-service, but at present the respective rates are only about 2 per cent and 1.5 per cent. During the war the cargo rate was 50 sen per yen 100 for the European or the American run, and 35 sen for the near-sea run, but the present quotations are

FIREMAN'S FUND

Insures Hulls, Cargoes,

HEAD OFFICE: CALIFORNIA AND SANSOME

JOSEPH HADLEY, European Agent
J. LOTHBURY, E. C.
LONDON

E. A. VALENTINE, Special Agent
714-715 BOARD OF TRADE BUILDING
PORTLAND, ORE.

FRANK G. TAYLOR, GENERAL AGENT FOR WASHINGTON, OREGON, ALASKA

35 sen and 25 sen respectively. Thus the incomes of marine insurance companies are doubly decreasing, owing to the shrinkage in the volume of business and the fall in premiums."

The underwriter, who, unlike the steamship operator, is primarily interested in values, will find a bird's-eye view of the last year in the following table of exports of the United States to grand divisions:

	Month of April 1921	1920	Ten months ending April 1921	1920
Europe	174,645,581	364,094,160	3,053,315,328	4,184,087,642
North America	94,307,233	152,652,752	1,464,326,037	1,274,581,215
South America	20,717,814	47,026,874	487,919,783	386,418,623
Asia	29,858,079	87,193,509	479,338,755	651,405,964
Oceania	14,610,811	19,640,515	239,066,179	145,011,197
Africa	5,775,969	13,711,582	125,353,954	92,584,042
Total	339,914,987	684,319,392	5,849,320,036	6,734,088,683

Coverage of Rejected Shipments

In these days of falling markets and enforced foreign economy, it is as well for the shipper to know where he stands as regards the insurance on rejected consignments. To this end he could not do better than attend the observations of so approved an expert on the subject as William D. Winter, third vice-president of the Atlantic Mutual Insurance Company, who had some interesting things to say about it when he addressed the National Foreign Trade Convention at Cleveland recently.

Repudiation of contract has introduced a new moral hazard into the insurance of cargoes. The underwriter may accept or reject the application of a merchant for insurance, but having accepted he must rely upon the merchant to control the secondary moral hazard by exercising reasonable care in the selec-

tion of those to whom he ships goods. An insurable interest is necessary to the validity of an insurance contract. When goods are shipped on c. i. f. terms the shippers have an insurable interest, Mr. Winter points out, in that they are responsible by the terms of the contract for the procurement of insurance; but they have no such interest when the terms are cost and freight, as they have divested themselves of title and are

or if this tendency does not materialize, a sale at auction to determine damage naturally results to the disadvantage of the underwriter in a depreciated and glutted market."

However, for an additional premium, the insurance may be extended by special agreement, with merchants of high standing, on c. i. f. shipments where they have had the original risk, until disposition of the goods can be made. But on cost and freight shipments the situation is very different. "Merchants should definitely understand," says Mr. Winter, "that they cannot protect themselves against the consequence of rejection of shipment in a marine insurance policy. The risk is purely a commercial risk incidental to the selling of goods. The problem is one to be solved jointly by the merchant and the banker. More caution in the selling of goods and greater care in credit investigation would do much to lessen this evil."

Livestock Coverage

in no way responsible for the insurance. Furthermore, the consignees, intending to repudiate the contract, may not have insured the shipment; the goods may still be in transit at the time the contract is repudiated without any insurance, or without insurance that is available to the shippers because they have no insurable interest in the shipment. Says Mr. Winter:

"When shipments are rejected an interruption of transit usually ensues, but this being caused by the act of the consignee will probably result in the abrogation of the insurance contract before the goods are safely warehoused. Underwriters on c. i. f. shipments hesitate to extend the insurance owing to the fact that with rejection the invoice value of the shipment disappears and the value becomes the market value of the goods at destination. If damaged, there is a tendency on the part of the shipper to endeavor to abandon the goods to the underwriter;

Just at present there is an active movement of livestock to Europe, entailing new problems to both shipper and underwriter. Rates are higher than before the war, because many of the vessels are new in the trade and their crews are inexperienced. Under old conditions, half a dozen years ago, the underwriters could show a satisfactory result in this line of trade. At the port of loading the United States Bureau of Animal Industry makes an inspection, and unless there is an absence of disease or exposure to contagion live stock will be prohibited from export. Practically all export cattle are insured against mortality from any cause, because underwriters insuring them subject to average are liable for death occasioned by an insured peril—as when an animal is killed from being tossed about in heavy weather, or burned to death—

INSURANCE COMPANY

Freights and Disbursements

STREETS, SAN FRANCISCO, CALIFORNIA

W. H. WOODRUFF, Special Agent
LOS ANGELES
239 BYRNE BUILDING

F. H. & C. R. OSBORN, Managers
ATLANTIC MARINE DEPARTMENT
72 BEAVER STREET NEW YORK

AND BRITISH COLUMBIA, 309 COLMAN BUILDING, SEATTLE, WASHINGTON

but there is no liability for mortality from seasickness, exposure or other natural causes. The two chief clauses covering mortality of animals are the so-called "walking ashore" clause and the "landed alive" clause. The former holds the underwriter for all animals unable to walk ashore at destination; the latter makes him liable if the animals are landed alive, no matter whether they can walk or not. Under the changes made a few years ago in the health laws of Great Britain, it is forbidden to land the carcass of an animal which died or was killed on the voyage; and this materially alters the outlook for the underwriter, as formerly he could sell the carcass for practically the full value of the animal. Consequently the underwriter is compelled nowadays to study the hardness of the animal, granting a lower rate for steers and mules, for example, than for horses, and charging top prices for lambs and calves.

Simpler Marine Contract Wanted

Considerable discussion has followed the plea made at a recent dinner of the Insurance Society of New York for less haggling over marine claims and for a more modern and simpler contract. The speaker, who is a prominent broker, insisted that "underwriters are raising technical pleas to avoid or reduce payments as never before." This the underwriters vehemently deny, except as such a charge may be, in instances, applied to the newer and less experienced offices. The old-timers are going their reputable ways as they have always done. But more can be said for the suggestion that the present marine policy is archaic in language and the stipulations based upon the experience of other nations through many centuries. I believe,

with the speaker, that the time is near when an American initiative would be acceptable toward a simpler form with a statement of conditions as direct as that of the standard fire policy, to be adopted in agreement with all trading nations. The objection would, of course, be instantly forthcoming from the older nations that no new contract could hope to possess the certainty now enjoyed by the time-honored policy because of the innumerable court interpretations given the latter. But the banks and the shippers have a perfect right to ask for something less antediluvian in expression, and consequently more intelligible, than the amazing collection of antiquities that at present composes the marine policy. At the very least, there should be standard clauses with uniform interpretation—not a particularly difficult goal to achieve, but one far removed from what now prevails.

Recent Syndicate Appointments

J. A. Wilson, attached to the staff of Syndicate A as surveyor since its organization last fall, has been made a deputy surveyor, and in this capacity will be executive assistant to the chief surveyor in the general direction and supervision of the now extensive surveying business of the syndicate. Mr. Wilson was formerly chief engineer in the North Atlantic passenger trade, and thereafter was, for a number of years, traveling engineer in the service of Babcock & Wilcox. Just prior to joining the syndicate he was general superintendent of installation of machinery and boilers at the Hog Island plant, where his success was demonstrated in the splendid performance records of the machinery installation of the vessels built there. His expert knowledge of turbines and boilers, combined with Chief Surveyor Foley's long and recognized experience in the field of ships' repairs, gives an

unusually strong executive combination to handle the exacting and difficult work of supervising damage repairs throughout the country.

The syndicate has followed out its policy of placing its representation abroad in the hands of Americans, where it is consistently possible so to do, by appointing as its agent in the Argentine the firm of F. B. O'Grady & Company, at Buenos Aires, with jurisdiction over all ports of the Argentine with the exception of Punta Arenas. The firm is favorably known in the shipping trade of the Plate. The senior partner was for several years vice-consul at Buenos Aires, and is in consequence in close touch with the American as well as with the European and Argentine commercial community. Thus, in connection with the services of the American Bureau's exclusive surveyor, David Currier, Jr., American ships in distress or in need of repairs on the River Plate will be afforded the protection of a purely American service, which must redound to the benefit of the American shipping trade.

Syndicate A also announces the appointment of William R. Porter as its sub-agent at Key West, that important turning point in the Gulf, so vital in hurricane seasons.

Greek Losses

London underwriters have been urging the Greek government to investigate the circumstances surrounding the extraordinary number of marine losses in connection with the foundering or sinking of commercial vessels of that nation since the termination of the war. Negligible foreign trade is suspected to have inspired the destruction of Greek shipping for the insurance money, and criminal proceedings are said to have been instituted in several instances. Within the brief period of five or

six weeks more than £3,000,000 in claims was presented to Lloyd's. In order properly to protect American goods shipped to Greece, it is urged that each bill of lading sent to that country be accompanied by full instructions and authority with respect to steps to be taken in case the merchandise is not withdrawn by the consignees within the forty-five-day period allowed by the Greek customs. Of late many shipments are said to have been left unguarded and unclaimed on the wharves, and are subject to being sold at auction without prior notice to the consignees unless the merchandise is removed within the above-mentioned time.

New British Hull Clause

Under the dual valuation system employed by British hull underwriters, the total loss value and premiums are considerably less than the average loss value and premiums, and therefore the following clause has been prepared by the Institute of London Underwriters to govern procedure in constructive total loss claims:

"Insured value for average purposes, £.....

"Insured value for total loss purposes, £.....

"In ascertaining whether the vessel is a constructive total loss, £..... shall be taken as the repaired value and nothing in respect of the damaged or break up value of the vessel or wreck shall be taken into account.

"In case of claim for total or constructive total loss, £..... shall be taken to be the insured value and payment by the underwriters of their proportions of that amount shall be for all purposes payment of a total loss.

"Should the steamer by reason of insured perils become a constructive total loss within the meaning of the above clause and should she not be repaired or should she be sold un-repaired, then the owners shall be deemed to have tendered and the underwriters to have accepted abandonment.

"Insurances allowed under the 15 per cent disbursements clause to be calculated on the amount recoverable for total loss."

Still the Theft Problem

Our readers, from time to time, come across accounts in this department of attempts to solve the serious problem of constant heavy losses from theft and pilferage, and in our last issue we announced what gave every promise of a successful termination of the determined struggle.

But once more there is only failure to record. Competition in the American marine insurance market appears to be too keen to admit of underwriters getting together. Recently London devised and unanimously adopted new clauses that have every prospect of meeting the situation. These were cabled to New York with the hope that something similar might be taken up on this side. The American Institute unanimously adopted them, but when they were sent out to the individual companies for ratification it was soon learned that two or three of the leading offices declined to fall in line; with the result that the clauses have fallen to the ground, as unanimous adoption is imperative. The sole remaining hope lies with the committee of New York Underwriters that has been carrying on a co-operative effort with various allied commercial bodies. These latter have endorsed the initial plan of procedure, but there still remains the always-present fear that selfish competitive interests will once more defeat the efforts of the committee. It is an ugly fact, no matter how unpleasant to contemplate, that we cannot do, in this particular matter, what our British competitors find comparatively easy.

Shippers on Pilferage

At last, in this continuous performance of advice to shippers by underwriters on the subject of theft and pilferage, the merchant has taken his day in court and comes forward with a few timely suggestions of his own. The representative committee of the Council of the Chamber of Shipping of London has issued a report as to the best methods to employ in preventing losses from these sources while goods are in transit. The two points most particularly stressed are the need for careful checking of cargo at the various stages through which it passes and the adequate guarding of port precincts so as to reduce the chances of stolen property being removed. The report shows, further, that certain steamship companies have a consistently lower pilferage rate than others because of more efficient tallying and watching arrangements. It also urges the importance of carefully checking goods when they are being discharged into lighters, on to open quays, and on to the quays of dock and warehouse authorities. It recommends efficient control and supervision by ship's officers in all cases where holds are open; stricter scrutiny of persons and conveyances entering and leaving dock areas; and

a more exacting system of "goods passes" for merchandise that is being removed from the docks.

Oil Tank Hazards

Last month we gave an account of the movement that is getting under way to combat the grave hazards to life and property involved in inadequate methods employed to detect and dissipate the perilous gases and vapors remaining in recently emptied fuel oil tanks. It is interesting to see that the agitation is gaining ground and that authoritative sources are behind an effort to introduce and enforce adequate regulations and rules. The marine fire hazards committee of the National Fire Protection Association has, through a sub-committee, gone thoroughly into the subject, and will submit a report that will embody the latest scientific conclusions. The methods employed by the United States Navy have been investigated, for instance. The Navy uses both steam and air, boiling out the tanks by a high-pressure pumping process for a period of twelve hours, followed by two more hours of pumping in event of vapors being discovered still adhering to intricate parts. This is followed by a chemical analysis of the air. Something of this nature will be recommended by the sub-committee, with the preference given to steam as the medium.

In the United Kingdom

The Atlantic Coast Shipbuilders' Association bulletin this summarizes marine insurance in England:

The prosperous conditions of the marine insurance market naturally have not continued, the business offering being insufficient to go round and assure profits. Various companies' reports clearly indicate the big change that has come about and they show how seriously conditions have deteriorated from the underwriting point of view. Two good examples are those of the London Assurance and the International Marine Insurance Company. In the case of the first-mentioned concern, marine premiums for 1919 were given as £260,500, and the sum of £331,500 was carried to profit and loss. Last year the premiums were £359,300 higher, but the amount carried to profit and loss dwindled down to £47,800. The report for the first financial year of the International Marine Insurance Company (issued a year ago) stated that "in view of the impossibility of estimating the profits which have accrued at the close of the first year's underwriting" no dividend would be declared. The present report says that there was

a loss on the first year, but it is not possible to say what the total loss is until the end of the current financial year. According to the first account, net premiums for 1919 were \$267,500, but further premiums relating to 1919 and received last year increased this sum by \$80,000 and at the end of last year the underwriting account showed a loss of \$8600. In 1920 premiums amounted to \$642,900, of which the first year's settlements represented 36.05 per cent.

Marine Insurance Bill

Following conferences in New York between representatives of the Shipping Board, steamship owners and underwriters, a new form of model marine insurance bill has been drafted and introduced in the House by Representative Edmonds of Pennsylvania. It bears the number H. R. 6775. Sections 20 and 21 of the old bill, which permitted companies to combine in making rates and the adoption of uniform policies, have been eliminated. The tax of 2½ per cent on the gross premium of insurance placed with foreign non-admitted companies has been stricken from Section 26.

In discussing the first draft before the Senate Committee on Commerce, Mr. Edmonds said that the object of the bill was to show the position of Congress on the subject in the hope that the legislatures of the various states will adopt similar legislation. Meanwhile it would be the law on marine insurance for the District of Columbia.

When the combination feature of the bill was under discussion, Senator Edge of New Jersey announced that he is unalterably opposed to any legislation which would tend to restrict competition. Chairman Jones said that in ordinary circumstances he was opposed to such legislation, but it was possible Congress might be confronted with such a situation as would make it advisable to enact such a measure.

In speaking of the marine insurance syndicates, Congressman Edmonds said that before these syndicates were formed foreign marine insurance companies cut rates to a low figure and after the American companies had been forced to retire from the business put the rates at a very high figure. Something must be done, he said, to overcome these conditions, and for this reason the insurance syndicates should not be handicapped. Senator Jones said that even if the proposed measure were enacted into law the companies could not combine in any of the states

where anti-trust laws exist. He believed that a test case should be instituted at once.

During Mr. Edmonds' remarks Ira Campbell, representing the American Steamship Owners' Association, asked whether he was in favor of the elimination of competition in the marine insurance business. "I think," replied Mr. Edmonds, "the insurance companies have just as much right to co-operate as the steamship companies have through conferences. And further than that, the insurance companies could give to the steamship companies cheaper insurance because of such co-operation."

Mr. Edmonds said he believed the formation of such combinations or syndicates would be of greater advantage to American shipping than can be realized at this time. There is no chance, he said, of insurance companies combining for the transaction of a cargo insurance business.

Mr. Edmonds was asked if he had any objection to striking from the bill the provision regarding the fixing of uniform rates. He replied that he had no objection to striking that out, but that other features of the combination section should remain, such as the fixing of a uniform policy by the companies.

Japanese Load Line Law

The following is the text of the Japanese load line law for ships, which was passed on March 8, and will be applicable to Japanese ships and ships of other nations at a date to be fixed by order later:

Art. 1. All Japanese vessels shall have their load line assigned and marked under this law, except the following:

1. Vessels mentioned in all the paragraphs of article 1 of the ship inspection law.

2. Vessels employed solely within the small coasting limit or the smooth-water limit.

3. Sailing vessels under 100 tons gross and employed solely within the large coasting limit.

4. Vessels employed solely in fishing, towing, salvage, dredging, or hydrographic purposes, and those especially exempted by the competent minister of state.

Art. 2. Except in cases specially provided for by the competent minister of state, a vessel shall have her load line assigned and marked when she is proceeding to sea for the first time as a vessel required to have the load line under this law. A vessel, which is to be built in the place where this law is in force, may have her load line assigned during construction.

Art. 3. Except in cases specially provided for by the competent minister of state, the load line shall be assigned by the local marine authorities having jurisdiction over the place where she is.

Art. 4. When a vessel has had her load line assigned and marked a load-line certificate shall be issued to that effect.

Art. 5. Except in cases specially provided for by the competent minister of state, a vessel for which the load line has been marked under this law shall not proceed to sea with a draft submerging that load line.

Art. 6. The load-line mark shall not be concealed, altered, or obliterated except for the purposes of escaping capture by an enemy or other reasonable causes.

Art. 7. An official inspector is empowered to enter a vessel, at any time for inspection or to detain her from proceeding to sea if he has reason to believe that she is violating this law.

Art. 8. The necessary rules for assigning and marking the load line, and the fees to be charged, shall be regulated by the competent minister of state.

Art. 9. A load-line certificate issued in accordance with this law and with rules under this law by a corporation or association for the survey and registry of shipping approved by the competent minister of state, together with the corresponding load-line mark, shall be recognized as equivalent to that issued and marked respectively under this law.

Art. 10. This law shall be applicable to vessels other than Japanese vessels, being in the port within the jurisdiction of this law.

Art. 11. When the load-line law and rules of a country to which the vessel in question in the preceding article belongs are considered appropriate by the competent minister of state, the load-line certificate issued under that law and rules, and the corresponding load-line mark, shall be recognized as equivalent to that issued and marked respectively under this law.

The provisions of the preceding paragraph shall not apply to vessels belonging to a foreign country which does not recognize the validity of the load-line certificate issued under this law and the corresponding load-line mark.

Art. 12. Except in cases specially provided for by the competent minister of state, if a vessel is employed at sea without a load-line certificate, or proceeds or attempts to

proceed to sea with the load-line mark submerged, the master of the vessel or a person acting for him shall be liable to a fine of not less than 100 yen but not exceeding 2000 yen.

Any person who contrary to the provision of article 6 conceals, alters, or obliterates the load-line mark shall be liable to the fine prescribed in the preceding paragraph.

Art. 13. Any person who has obtained a load-line certificate by fraudulent or improper means shall be liable to imprisonment for a period not exceeding one year or to a fine not exceeding 1000 yen.

The provisions of the preceding paragraph shall also apply to a person who has violated the provisions contained therein outside the bounds of the empire.

Art. 14. Any person who resists or impedes the inspection of the official inspector or violates the order detaining the vessel shall be liable to a fine not exceeding 1000 yen.

Supplementary Rules

Art. 15. The date of enforcement of this law shall be fixed by the Imperial ordinance.

Art. 16. Japanese vessels holding, at the time of the enforcement of this law, a load-line certificate issued by a corporation or association for the survey and registry of shipping approved by the competent minister of state and having the corresponding load-line mark shall be recognized as having the load-line certificate under this law and the mark corresponding thereto.

The provision of the preceding paragraph shall be applicable to any vessel other than a Japanese vessel which may be in a port within the jurisdiction of this law at the time of enforcement of this law, so long as she remains in that port.

Art. 17. For Japanese vessels not coming within the provisions of the first paragraph of the preceding article this law shall not be applied until the load line is assigned in accordance with the regulations provided for by the competent minister of state.

Japanese Classifications

The Imperial Japanese Marine Corporation up to the end of April had classed five vessels of 12-293 tons gross, four of which belonged to the Yamashita Kisen Kaisha and one to the N. Y. K. At the same time the society or the British Corporation, with which it works, expected to class five new vessels; and five others, formerly

classed by Lloyd's, had been transferred. These last were: Kleist, ex-German, N. Y. K.; Chosen Maru, O. S. K.; Myogisan Maru, Mitsui; Kunishiri Maru, Department of Communications; and Taiyo Maru, ex-German, T. K. K.

Kakichi Uchida, chairman of the Japanese committee of Lloyd's Register, said: "We hope to carry on operations in peaceful relations with the British Corporation. That Lloyd's has entrusted its powers in this country to the Japanese is a great event auguring well for further promotion of friendship and commerce between Japan and Great Britain. Lloyd's Register has classified and surveyed 58 per cent of the vessels built in this country and the British Corporation cannot be compared with it."

The Motorship Kennecott

The Alaska Steamship Company's motorship Kennecott, now operated by the Williams Line in its inter-coastal service, has come and gone and left a decidedly good impression with underwriters. When her hull insurance was placed recently she received an unusually good rate, which "was practically equivalent," it was stated, "to that of the best steamer." This was the first motorship hull insured on the Pacific Coast, inasmuch as the Standard Oil Company's Charlie Watson had been placed with the rest of the fleet.

Good steamer rates also are being extended to Kennecott cargo. Time was when motorships took an appreciably higher rate than steamships, as was the case with the Siam, the first motorship to appear on the West Coast. Her relatively unknown machinery was looked at askance as making her liable to average claims, and a higher rate was asked. But conditions have changed radically. The Kennecott especially is regarded as being an excellent vessel, on which the Todd yard at Tacoma did its best work, and it is well known, of course, that McIntosh & Seymour extended themselves on her engines.

S. A. Livingston has been appointed underwriter of the Aetna Insurance Company's marine office, San Francisco, under J. A. Mathews, Pacific marine general agent. In 1907 Mr. Livingston entered the office of his father, John Livingston, marine underwriter of San Francisco. In 1913 he went to the Phoenix of London, and in 1918 to the marine department of Balfour, Guthrie &

Company. He is a brother of the late E. S. Livingston, former marine general agent of the Aetna in San Francisco.

Edm. L. Woods, secretary of the Board of Marine Underwriters, San Francisco, will sail for England in July for a stay of two months or more. This will be Mr. Woods' first visit to his native country in thirty-seven years.

Captain H. H. Marden, Puget Sound pilot who was in charge of the steamship Governor when she was rammed by the West Hartland and sunk April 1, has been punished by suspension of his license for one year. He was charged with inattention to duty.

West Hartland Libel

The Pacific Steamship Company, through its attorneys, Grosscup & Morrow, has filed a libel against the steamship West Hartland, which sank the steamship Governor April 1, and against the Shipping Board, owner of the West Hartland. Damages are asked of \$2,250,000, value of the Governor; \$100,000, value of baggage and personal effects of passengers; and \$150,000, value of the Governor's cargo. The West Hartland is charged with full blame for the disaster and her officers are charged with negligence.

At present prices the West Hartland would satisfy only a small portion of these claims.

Westinghouse Report

The gross earnings of the Westinghouse Electric and Manufacturing Company from sales billed for the year ending March 31, 1921, were, as shown by the company's annual report, \$150,980,000, which is an increase of \$15,000,000 over the gross earnings of the previous year. The manufacturing and selling cost was \$138,774,000; and the net income available for dividends was \$12,618,000, or 16.8 per cent on the company's capital stock. Dividends at the rate of 8 per cent were paid during the year on both the preferred and common shares of stock.

During the year the position of the company in the radio electrical field was greatly strengthened by the acquisition of exclusive rights under the patents owned by the International Radio Telegraph Company. These rights, together with others already owned, place the Westinghouse Company in a favorable position to develop and manufacture apparatus in a field that presents great future possibilities.

FULL SPEED AHEAD

Steamship Operations

Three Conferences Formed

Developments of June widened the break between the California and Washington lines of the Pacific Westbound Conference. The Seattle meeting, held early in the month, accomplished nothing whatever toward bringing the two districts together, for the California companies stood pat, and the Washington lines, to put it mildly, were rather belligerent. Neither attitude, of course, conduced to a restoration of the Pacific Westbound. Under the name of the California Pacific Westbound Conference the southern operators now make their own local rates, of which they advise the North, and both districts remain subject to the New York committee, so far as transcontinental rates are concerned. Portland also organized a separate conference, which survived despite vigorous opposition of Seattle and despite the withdrawal of the Admiral Line. Apparently, however, the conference succeeded in enlisting the Admiral again, and this having been accomplished, announced its intention of maintaining an organization, although at one time the T. K. K. and Columbia-Pacific, the other members, had been inclined to turn a favorable ear to proposals for amalgamation with Seattle.

New York a Sore Spot

This present settlement may not endure long. Trouble may brew at any time in New York. One of the immediate occasions of the split on the Pacific Coast was the dominating position of Seattle, which had more trans-Pacific lines and consequently more votes than San Francisco. The same condition still obtains in New York. If the California lines objected to dictation by Seattle in the making of Pacific Coast rates, they naturally would find fault with the same dictation in overland trade. In fact, they have adopted the policy of insisting upon some equalization of strength on the Atlantic; failing this, they may jump over the traces altogether, leaving the trans-Pacific situation "split wide open."

Pending the formal organization of a conference in Seattle, the old committee of the Pacific Westbound Conference agreed to advise the new California organization of rate

changes, San Francisco to do likewise for Seattle. This understanding, combined with the adherence of both groups to the New York committee, practically gave the California lines what they had demanded of the Northern; and the situation would not be at all bad, were not the same and other elements of trouble present. Among the latter may be cited the organization of the conference at Portland and the threat of Vancouver to break off from the Seattle committee. In such conditions are to be found the seeds of rate-wars, even though the event would find city aligned against city instead of a few outside lines against a conference.

Bonds to Be Posted

In order to strengthen its control over individual members, the new Seattle committee decided to provide a sixty-day withdrawal clause and the posting of a bond of \$5000, to be forfeited in case of rate-cutting. Such a proposal had been made to the California lines before, and they had rejected it because the Java-Pacific positively refused to listen. Seattle apparently places much reliance in the plan and has received the sanction of the Shipping Board for posting bonds and for a sixty-day notice of withdrawal.

At the meeting held in Seattle June 2, M. J. Mayfield, agent of the old Pacific Westbound Conference, represented the San Francisco operators. Mr. Chapin of the T. K. K. office, San Francisco, also was present. Mr. Mayfield explained to the northern lines that California had organized a separate body composed of the Pacific Mail, Java-Pacific, T. K. K. and Struthers & Dixon, but that it was quite willing to work with Seattle to exchange local rates and to consider suggestions. Announcement also was made of the organization of a conference in Portland, the members being T. K. K., Columbia-Pacific and Admiral. The last withdrew immediately, however.

Possible Sources of Trouble

What would happen in the event that a northern line, the O. S. K., for example, should enter San Francisco for cargo, or a southern line, such as the Java-Pacific, should enter Seattle, was discussed at length, and the fact was developed that

trouble might occur over the rate to be charged. Portland representatives also explained their situation, saying that their position between the North and the South required independence of action so long as there were two conferences. Some cargo peculiar to Portland, such as phosphate rock and Utah coal, was cited as being a proper subject for the control of that city alone. In this discussion it was brought out that Portland also feared the majority power of Seattle, the old lumber rate of \$10 being cited as unnecessary and as needlessly sacrificing \$2.50.

After more discussion of different phases of the problem, the northern lines bluntly threatened to ignore San Francisco conference rates and to send vessels into that port to get business, regardless of the established tariffs. Despite this threat, however, and the manifest ill-feeling being generated between the two sections, the North finally agreed to advise the South of rate changes, provided that the South would reciprocate.

The T. K. K. and Columbia-Pacific expressed their willingness to join the Seattle conference, if certain difficulties were removed, and, pending negotiations, to abide by Seattle rates unless pressing competition forced a violation. As was stated above, however, Portland now appears to be determined to go its own way.

Seattle Membership

Members of the Seattle Conference will be: Nippon Yusen Kaisha, Osaka Shosen Kaisha, Canadian Pacific Ocean Services, Frank Waterhouse & Company, James Griffiths & Sons, Canadian Government Merchant Marine, Blue Funnel, Struthers & Dixon and the Admiral Line.

Some lines, it will be noted, are members of two conferences, Struthers & Dixon, for example, being in both the Seattle and San Francisco organizations.

A Free-for-All

Difficulties are arising to vex the intercoastal and trans-Pacific steamship lines in the application of their agreements for the transportation of freight between the Atlantic Coast and the Far East at all-water rates. A few months ago, it will be recalled, the companies made arrangements for transshipping cargo at ports of the Pacific Coast, transfer charges to be absorbed and the

net proceeds to be divided equally between the intercoastal and trans-Pacific lines. So long as through rates remained sufficiently high the plan promised a fair volume of business, especially of imports, which had the choice of two markets instead of only one.

A Wallop from Singapore

But both foreign and American direct lines polished up their clubs and hit whatever heads they saw. The first resounding whack came from the direction of Singapore. The Straits-Atlantic companies, discovering that the intercoastal lines had fixed a minimum rate of \$16 a ton, immediately reduced their general merchandise quotation to \$15. Perhaps that result was not unexpected. To the trans-Pacific operator it was the logical sequence of the publication of a minimum; but the intercoastal operator retorts that he could not give the Oriental agencies a free hand to meet any rate that might be quoted by direct steamships, that he was compelled, in brief, to call a halt somewhere. Whether the direct rates from other Oriental ports to the Atlantic likewise were reduced is not definite, but so little cargo is moving that no one worries much. Quite a good bit of business did develop during the first few weeks of the agreement, although this now appears to have been largely wool that was being rushed to the United States to anticipate emergency tariff legislation, and naturally discharge at a Pacific Coast port was preferred, inasmuch as slower delivery at the Atlantic might defeat the scheme.

Not a Private Brawl

The Barber Line, guessing rightly that the brawl was not private, decided to take a hand. This company operates the only direct North Atlantic-Panama-Oriental service with Shipping Board vessels. It protested to the board against the absorption of transfer charges at Pacific Coast ports, and the board, through the traffic division, requested the North Atlantic-Pacific Coast Westbound Conference to do away with the absorption. The conference obliged.

Step Lively, Please!

But the Pacific Coast-North Atlantic Eastbound Conference was composed of different spirits. They would as soon fight the Shipping Board as anyone else. Stripped of diplomatic persiflage, their reply was exceedingly short, not to say curt. Thereupon the traffic department intimated that it might solve the question by permitting the Barber Line to engage in the inter-

coastal trade, incidental to its Atlantic-Orient service. This gave the conference something to think about, because the Barber Line might find the intercoastal trade to its liking and decide to remain. After quite a bit of discussion, the members of the conference abrogated their individual agreements; but inasmuch as some lines that used common piers might transfer freight without any added expense, the system probably has not been completely destroyed.

In its communication to the conferences, the Shipping Board held that the absorption of dock transfer and incidental charges at Pacific Coast ports operated to the detriment of the direct Oriental-Atlantic lines. In this view the Pacific Coast-North Atlantic conference did not acquiesce. It said, on the other hand, that the intercoastal lines were making no concessions, but were merely meeting the direct rates. Even so, the joint service could not be so desirable as the direct; therefore, meeting the direct tariff did not place the two services on a parity. And besides, the arrangement was not designed to attract shipments but was to meet existing competition of the transcontinental railroads and of intercoastal-trans-Pacific lines using the same docks, as, for example, the different lines of the Pacific Mail, which ply to the Atlantic and Far East, Williams and Struthers & Dixon; Pacific Steamship and Nawsco. Freight could be discharged from a Nawsco steamship and picked up by an Admiral vessel, for example, without the incurring of any transfer cost beyond that of discharging and loading, one of which is bound to be incurred in any event. A final argument, neatly formulated and presented, was that the predominating service between the Orient and North Atlantic was foreign, and therefore, that any arrangement meeting rail and trans-Pacific competition, the direct rate not being cut, was to the ultimate advantage of the American merchant marine.

Regarding the Barber Line being permitted to engage in the intercoastal trade, the conference replied that the berth had too much tonnage and that practically all vessels were operating with less than capacity cargoes. Furthermore, the board had stated in a formal resolution that it would not allot more government tonnage to the intercoastal trade. This was done when it refused, at the instance of private operators, to withdraw vessels from the Nawsco Line. Relying

upon these promises, said the conference, private operators had been building up their lines.

In this interchange of notes, the operators appear to have had the advantage of logic. But they realized that logic availed little against a big stick, and decided, as stated, to play with the board, trusting to some dark night for revenge. When the private operators of the United States finally march on Washington they will make that little burning by the British a hundred years ago resemble a Sunday school picnic.

Panama Canal Tonnage

The conference was quite correct in stating that the predominating service between the Orient and the Atlantic was foreign. During April, for example, 80,674 long tons of cargo moved through the Panama Canal from the East Coast to Asia; British vessels carried 32,414, American 26,758 and Japanese 21,502. Most of that good business would have been shipped overland to Pacific Coast ports if there were no canal. In the other direction, however, only 11,303 tons moved, of which Japanese vessels had 9103 and American 2200.

American vessels make a much poorer showing in the Atlantic-Australasian trade. The westbound cargo of April was 65,621 tons, British vessels carrying 53,200, American 6500 and Japanese 5921. In the contrary direction the single cargo was 5420 tons, which was carried by an American steamer.

In the total tonnage of all routes for the month of April, westbound traffic predominates, as usual. From the Atlantic to the Pacific 500,801 tons moved, as compared with only 406,812 from the Pacific to the Atlantic. The latter total is 40,000 tons less than that of March and 62,000 less than that of April, 1920. The former total, that of Atlantic-Pacific business, is relatively much smaller, being 136,000 tons less than that of March, 1921, although 102,000 more than that of April, 1920. The aggregate decline of April under March was no less than 177,000 tons.

South American Agreement

Close co-operation between steamship lines operating from the Pacific and Atlantic coasts of the United States to the east coast of South America will result from a new working agreement now being formulated. In view of the fact that the different lines, though plying from the two coasts of the United States, were competitive to some degree, it was decided to place

some rates on a parity and to give others into the control of one conference or the other. Thus the Atlantic would have the initiative in fixing a machinery rate, inasmuch as the larger consignments of such freight are from the Atlantic; and the Pacific would have the initiative as to wheat, lumber, etc. Each conference of course would conform to the rate fixed by the other.

The same working agreement is being discussed for the west coast of South America. Nothing conclusive has been done, however.

New Australasian Conference

A conference to control rates on freight moving between the Pacific Coast of the United States and Canada and Australasia will be organized within a short time by most if not all of the operators engaged in that trade. That no conference has existed up to this time is rather singular, in view of the number of lines engaged and the almost universal organization of rate-making bodies in other trades; but quite a number of the companies are relatively new and the older-established lines got along informally without any actual organization.

The lines that are expected to join are the Union Steamship Company of New Zealand and Oceanic Steamship Company, operating from San Francisco only; the General Steamship Corporation and Yamashita Kisen Kaisha, operating from the Pacific Coast generally; the Canadian Government Merchant Marine, a new line, and the Canadian-Australasian Royal Mail Line (Union Steamship Company of New Zealand), which runs from Vancouver to Auckland and Sydney via Honolulu and Suva. The Yamashita service also is new, having been recently announced.

One interesting aspect of the situation is that the American lines may have an opportunity to enter the Canadian-Australasian paper trade. About 125,000 tons of paper and pulp moves annually. Heretofore the rates have been more or less secret; now they will be placed on the table.

Committees will be organized in San Francisco and Vancouver; the headquarters will be in San Francisco.

Although the conference is just being formed, it has gone ahead with rate reductions. Some of the more important are: canned salmon, from \$25 to \$18; general, \$25 to \$20; shooks, \$15 to \$10. Lumber remains at \$20. The tariffs are effective from all Pacific Coast ports

to Auckland, Wellington, Sydney and Melbourne.

The Strike on the Pacific

Private steamship operators of the Pacific, acting through the Pacific-American Steamship Association and the Shipowners' Association of the Pacific, steadfastly refuse to join with the Shipping Board in the new agreements recently arrived at and signed, through Secretary of Labor Davis, with the marine engineers and radio operators. The following joint resolution of the two organizations was issued in June:

"In view of the reported negotiations between the Marine Engineers' Association and the Shipping Board, the Pacific Steamship Association and the Shipowners' Association of the Pacific wish to announce that there will be no departure from the policy as covered in the resolution published in the press a short time ago, as follows: 'Resolved, That the undersigned associations will not confer or negotiate, now or at any time, with the Marine Engineers' Beneficial Association as at present constituted and organized.'"

Except for the action of the Shipping Board, which generally is condemned severely by private operators, the strike situation on the Pacific was satisfactory to owners. They were succeeding in obtaining more men at the reduced scale and they expected a break among the unions themselves, which would tend to make the position of the operators even stronger. As is well known, the locals of the marine engineers were by no means a unit in accepting the new scale to which President Brown agreed. This resentment promised to create a split in the Marine Engineers' Beneficial Association. Other unions, moreover, were inclined to regard the action of the engineers as a betrayal of the common cause, especially since the Shipping Board broke off all negotiations in June and left the seamen, firemen, stewards, etc., in no enviable situation. These different factors made for optimism among the owners.

An interesting little controversy appeared in San Francisco in late June. The marine engineers were assessing tugboat engineers, who had remained at work, as much as 50 and 75 per cent of their salaries. As a result, men began to quit their jobs rather than give up half of their earnings.

The Red Stack, Rolph and Peterson tug companies, San Francisco, announced wage reductions of 15 per cent June 20.

Passenger Services Improve

The allotment of ten Shipping Board 535's, five to the Pacific Mail and five to the Admiral Line, and three 522's, all to the Pacific Mail, apparently is putting other trans-Pacific lines on their mettle to meet the new competition. The charter of the former German steamship, Cap Finisterre, now Taiyo Maru, by the Toyo Kisen Kaisha, was announced several weeks ago. Now comes the Canadian Pacific with two German vessels, which have been purchased of the British government. The Prinz Friedrich Wilhelm, 17,099 tons gross, will be renamed Empress of China and will ply between Vancouver and the Orient. The other vessel, the Kaiserin Auguste Victoria, 24,581 tons gross, will be renamed Empress of Scotland and will be employed in the Atlantic.

Reports from Vancouver state that the Empress of Japan, the oldest of the Canadian Pacific fleet, is being offered for sale. Should no satisfactory bid be received, she probably will be placed in the Calcutta-Hongkong feeder service.

Taiyo Maru Arrives

On her first trans-Pacific voyage under the T. K. K. flag, the Taiyo Maru arrived at San Francisco late in June. The Toyo Kisen Kaisha arranged for a public inspection of the vessel June 30. On the next day a limited number of invited guests were to be taken for a cruise about the Farallones. After luncheon was served on board the Taiyo Maru the guests would be entertained by a band, Japanese wrestlers and a bevy of swimming girls.

The T. K. K. also is improving its South American service. The first of three large combination vessels built by the Asano yard, the Rakuyo Maru, sailed from Hongkong June 10. Two others, Bokuyo Maru and Ginyo Maru, remain to be delivered. The Kiyo Maru, formerly used in the South American trade, now is being employed solely as a tanker.

The 535 Keystone State assigned to the Pacific Steamship Company, sailed in ballast from Philadelphia for Seattle June 2. She was rushed to the Pacific to replace the Wenatchee, which will be laid up for thirty days for alterations, principally for her ventilating system. The Wenatchee will resume trans-Pacific sailings July 30. The Silver State sailed from New York June 4 for Seattle via way ports with 7000 tons of cargo and a large passenger list. She will sail from Seattle in the

Pacific Steamship Company's Oriental service July 9.

Intercoastal Changes

The Luckenbach Line announces that the large 15-knot steamships, Andrea F. and Lewis Luckenbach have been added to the intercoastal service. All the vessels now engaged in the Atlantic-Pacific trade are of the largest and fastest Luckenbach class.

The Shipping Board 535 Empire State, the second of five to be operated by the Pacific Mail, departed from Baltimore for San Francisco in June and will sail from San Francisco for Honolulu and the Orient July 23. The Matson Company's Buckeye State was delayed in departing from Baltimore for San Francisco in June, fire having damaged her badly. The Hawkeye State, which was retired for one voyage to permit of alterations being made, sailed from Baltimore June 25.

On the Mexican Coast

Consul Yost at Guaymas reported on May 3 that within a few days four merchant vessels, which the Mexican government recently purchased in Canada and which are now in the Gulf of Mexico, were expected to be brought to the Pacific Coast of Mexico. Two of the vessels are to be used in the freight and passenger service between Manzanillo, Islas Maria, and Mazatlan; the other two are to have their headquarters at Guaymas, whence they will serve ports in the Gulf of California and the Pacific littoral of Lower California, including Ensenada.

The Stark Steamship Company announces that beginning with the sailing of the Georgina Rolph from San Francisco June 18 the company will operate to South American as well as Mexican ports. The steamship Centralia has engaged in the San Francisco-Mexico trade.

The Red Star Line has placed three third-class vessels in the New York-Danzig-Libau service. The company developed a good business last year with various sailings of the same vessels to Baltic ports, and now has placed them regularly in that trade.

W. R. Grace & Company, Johnson Line agents, announce the sailing of the combination motorship Balboa from Pacific Coast ports for Hamburg in August.

The Mexican Steamship Company is reported to have purchased the steamships Bolivar and Washington, which will be used with the steamship Mexico between San Francisco, Los Angeles and Mazatlan.

The Williams Line announced in June that it had established a feeder service to New York and would accept cargo at certain outside ports at New York rates. Due to objection by the Shipping Board, however, the application of New York rates and the absorption of lighterage, etc., at New York have been discontinued, although the Williams Line will continue to issue through bills of lading.

The first vessel of the new Orient-Pacific Coast-Australasian service of the Yamashita Kisen Kaisha probably will arrive on the Coast in September, said Frank K. Hitching, its agent. Mr. Hitching said that the company probably would not join the new Australasian conference formally, although it had no intention of breaking conference rates.

The Congress Line, for which Mr. Hitching was agent, has abandoned all effort to resume intercoastal operations. It scarcely had begun when the Shipping Board seized its vessels.

The Royal Mail Steam Packet, which will operate motorships in its joint service with the Holland-America between Europe and the Pacific Coast, announces that the first vessel, the Somersetshire, will arrive at Pacific Coast ports in July. All the vessels will have refrigerated space.

Golden State's Record

A new record in trans-Pacific service was established recently when the steamship Golden State, first of the 535-ton passenger and freight carriers assigned to the Pacific Mail Steamship Company by the United States Shipping Board, entered the Bay of San Francisco thirteen days, seven hours and forty-eight minutes after leaving Yokohama, exclusive of the time spent at Honolulu, says the Pacific Mail house publication. The new liner maintained an average speed of 16.62 knots during the return trip over the "Sunshine Belt to the Orient."

The fastest run in proportion to the distance between ports was made from Yokohama to Honolulu, the total time being eight days, nine hours and thirty-seven minutes, with an average speed of 17.7 knots. The steaming time of the Golden State from Honolulu was four days and twenty-two hours.

Flying the Stars and Stripes and the house flag of the Pacific Mail Steamship Company, the Golden State is the first vessel of her type to make a round trip between San Francisco and ports of the Orient. One of the remarkable features of the run from Hawaii was the fact that she overtook four other well-known trans-Pacific vessels, showed them all her heels, and steamed in through the

Golden Gate a day in advance of them all.

The four-masted schooner Irene, Captain Carlson, arrived at Aberdeen May 19 after a voyage of fifteen days from Honolulu. This appears to be a record for the northbound passage, although the schooner Kitsap used to make fourteen days from Grays Harbor or Puget Sound to Honolulu with remarkable regularity.

Forty days from Melbourne, the four-masted barkentine Aurora entered the Straits of Juan de Fuca May 26, having averaged more than 182 miles a day. Her best previous time was sixty days. The forty-day voyage is believed to be a record.

Panama Oil Storage

Three steel tanks of 55,000 barrels capacity each were added to the petroleum storage facilities at the Atlantic entrance to the Canal in the month of April; and a fourth tank of the same capacity has been completed but is not yet filled, says the Panama Canal Record. The United Fruit Company, the Arrow Oil Company, and the Pacific Mail Steamship Company each owns one of the three tanks already filled, and the Huasteca Petroleum Company owns that which is completed but not yet filled. The storage capacity of the different tanks at both ends of the Canal is now as follows: Panama Canal, 396,368 barrels; Panama Canal Storage Corporation, 221,456; West India Oil Company, 194,946; Union Oil Company of California, 149,078; Huasteca Petroleum Company, 166,721; Texas Company, 111,515; Arrow Oil Company, 55,000; Pacific Mail Steamship Company, 55,000; United Fruit Company, 55,000; Panama Agencies Company, 25,064; total, 1,430,148. Of the capacity of the Panama Canal, one tank of 55,954 barrels at Cristobal and one of 4038 at Balboa are for Diesel oil.

Hawaiian Sugar Low

A marked falling-off in sugar shipments from Hawaii to San Francisco and the Atlantic Coast, New Orleans-Philadelphia-New York, appears to be a certainty. Estimates of the decline from normal range between 150,000 and 200,000 tons, or between one-third and one-fourth of the output of approximately 600,000.

During the first half of 1920 the Japanese labor of Oahu was on strike. This adversely affected the 1921 crop, which did not have proper attention. On top of this came an exodus of Japanese to their native country and, worst of all, a go-slow attitude on the part of those that remained. As a result,

some fields are in bad condition and apparently little can be done to save them. A delegation was dispatched from Honolulu to Washington to urge Congress to permit the importation of Chinese labor, and the planters also have been active in the West Indies; but whether these different efforts can be of much avail this season is very doubtful.

Should the worst be realized, and a decline of 200,000 tons be registered, the Hawaiian carrying trade, no less than the islands themselves, will suffer severely. Up to this

time the Hawaiian business, both eastbound and westbound, had been probably the best in the world, and the Matson Line was in the enviable position of holding contracts for both the Atlantic and Pacific.

The Hawaii-San Francisco sugar rate has been reduced another 50 cents, from \$5.50 to \$5. The total reduction this year is \$1.

Isthmian to Gulf

Following announcement by the Luckenbach Line of a Pacific-Gulf service, the Isthmian Line, through

Norton, Lilly & Company, general agents, also has announced that it would maintain monthly sailings beginning with the departure of the steamship Anniston City from New Orleans June 15. Ports of call will be New Orleans, Mobile, Los Angeles (Wilmington), San Francisco, Portland and Seattle. Should cargo offerings justify, sailings will be increased. The Isthmian Line now has three distinct intercoastal services: Atlantic-Pacific, Gulf-Pacific and Atlantic-Pacific-Hawaii.



Sketch prepared by the San Francisco office of the Luckenbach Line showing the freight charges on sodium carbonate a hundred pounds from cities of C and B territory. From each shipping point run two lines, one to the lower left, where the rail rate to New Orleans will be found; the other to the Philadelphia rate on the lower right. In the upper right corner are Philadelphia-Pacific Coast and New Orleans-Pacific Coast water rates and the all-rail rates from groups C and B to the Pacific Coast. By using the data here given one may determine in a few seconds the relative costs of shipping by three routes. The serrated line crossing Ohio is the division between C and B territories.

Gulf services heretofore had been maintained by Swayne & Hoyt (Pacific-Caribbean-Gulf Line) and by the Atlantic-Gulf & Pacific.

The accompanying charts, prepared by the San Francisco office of Luckenbach, have a story to tell of the Gulf trade.

Mexican Oil Imports

Petroleum imports into the United States in the fiscal year ending June 30 will be nearly twice that of any earlier year, notwithstanding the enormous production of our own oilfields. The total quantity of petroleum imported into this country, which itself produces two-thirds of the oil of the world, will be nearly 6,000,000,000 gallons against about 3,000,000,000 in 1920, approximately 2,000,000,000 in 1919, 1,500,000,000 in 1918, and 1,000,000,000 in 1917, says a statement of the National City Bank, New York.

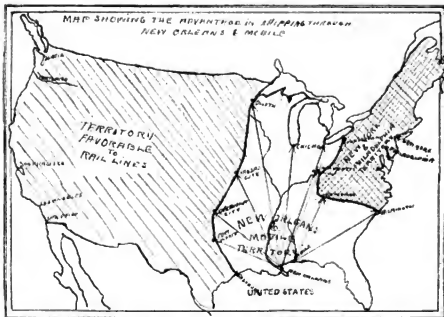
Practically all of the oil imported from Mexico comes by tank steamer, the quantity imported by rail being extremely small. About one-third of the crude enters at the Gulf ports of Galveston, Sabine and New Orleans, while most of the remaining two-thirds passes through the Gulf northward to Baltimore, Philadelphia and New York. The latest available figures of the importation by ports are those of the calendar year 1919, and show 545,000,000 gallons entering at the port of New York, 202,000,000 at Baltimore, 196,000,000 at Philadelphia, 350,000,000 at New Orleans, and Galveston and Sabine about 200,000,000 gallons each.

Shipping Briefs

P. A. S. Franklin, president of the International Marine Company, at a meeting of the board of directors of the company in New York, announced the regular semi-annual dividend of 3 per cent on the preferred stock of the company, payable August 1 to stockholders of record at the close of business July 15. The officers of the company were re-elected by the board of directors for the ensuing year.

Suez Tolls

The Suez Canal Company during the war imposed tolls on shelter-deck spaces only when actually used for passengers or cargo, waiving on account of war necessities its former rules. Beginning with March 1, 1921, the former rule has been restored, and after that date shelter-deck spaces will be liable for tolls, whether or not actually used for passengers or cargo on the voyage through the canal, if such spaces



Map prepared by the San Francisco office of the Luckenbach Line showing the advantage of shipping to the Pacific Coast through New Orleans and Mobile in preference to Atlantic ports. The present rail and steamship rates are such that, in competition with New York, Philadelphia, etc., the Gulf ports are able to command shippers from the entire Mississippi Valley and the Atlantic as far north as Wilmington. This map is based on average rates and therefore does not hold good for every single commodity; nor does it take into account ports of the South Atlantic, such as Savannah. But it does indicate what business New Orleans and Mobile may expect to do with the Pacific Coast so long as those cities enjoy a water differential of approximately 25 cents a hundred pounds less than North Atlantic rates.

have been so used before August 1, 1914, or after March 1, 1921.

Coal Bids

Bids received by the army depot quartermaster, San Francisco, for 43,000 tons of coal to be used during the next fiscal year were as follows: Standard Coal Co., Utah coal, \$11.62 a ton; King Coal Co., Utah coal, \$11.77; same, Comax, \$11.22; same, Manchurian, \$10.36; same, Australian, \$11.48; Rolph Navigation & Coal Co., Utah coal, \$13; same, Australian, \$13. Standard was the lowest bidder on American coal.

Alaska and Section 27

A test suit has been filed in Juneau by the Alaskan territorial government and Juneau Commercial Association seeking to set aside Section 27, Merchant Marine Act, which would prohibit diversion of American cargo to Canadian ports for shipment to Alaska. A test cargo was shipped from a Canadian port to Juneau and the territory requested an injunction restraining the Federal government from interference. However the suit may be disguised, it is essentially a fight against the coastwise laws.

Seattle Wharfage

Seattle is having trouble in abrogating wharfage charges and assessing handling charges between ship's tackle and point of rest against the

carrier. The steamship companies refuse to assume the charge unless they are permitted to do the work. They do not object to making Seattle free for the shipper, but they do object to paying for work done by another.

Other ports of the Pacific, San Francisco included, are considering the adoption of some such plan to meet Seattle and Portland.

Reciprocal Exemption

Senator Jones has introduced a bill (S. 1942) to secure for the American merchant marine exemption from foreign income and excess profits taxes in return for reciprocal treatment of foreign shipowners by the United States government. The bill is the result of conferences held for several months by the Inter-Departmental Committee consisting of representatives of the State and Treasury Departments and Shipping Board.

The American Ship & Commerce Corporation authorizes the following statement: The American Ship & Commerce Corporation has designated the American Ship & Commerce Navigation Corporation to execute the agreement that was negotiated last year by the Harriman shipping interests and the Hamburg-American Line for the joint maintenance of shipping routes. The American Ship & Commerce Navigation

Corporation's agreement is in the same form as the original compact which was made public last fall, and continues the terms then announced.

I. M. M. Report

The International Mercantile Marine estimates its 1920 earnings at \$9,440,157, as compared with \$17,062,912 for the year 1919. Inasmuch as the dividends of subsidiary British companies, however, have been converted into dollars at the standard rate of \$4.85 to the pound sterling, in order to afford a just basis of comparison with preceding years, the actual earnings, expressed in dollars, were less than those given. The net earnings of the I. M. M., plus dividends from subsidiaries, less taxes and interest, were \$8,307,283, the pound being converted into dollars at market exchange on the day received.

Shrinkage of freight traffic and the various handicaps to a large immigrant travel, among which is

the recent law limiting immigration, has caused the net earnings for the first part of 1921 to be considerably less than for 1920. The report to the stockholders continues:

"It is impossible to predict a material improvement in the situation in the near future, as this can only be brought about as political, economical and labor conditions in Europe improve and the buying ability of the European nations is gradually restored. In the meantime our property is being well maintained and judiciously strengthened, our cash position is strong and we feel that the company is well equipped to maintain its position in its various trades, and is in excellent condition to weather the storm through which shipping is now passing."

The company paid 10 per cent during 1920 on unpaid back dividends, leaving 42 per cent still due preferred stock.

Rates and Freight

Rail Rates Cut

Transcontinental railroad rates are being forced down by the competition of intercoastal steamship lines. Repeated announcements of reductions were made in May and June, but at this writing the Interstate Commerce Commission has not given the sanction required in some cases, and the intermediate territory manifests a disposition to fight.

An important development is in iron and steel. Following upon a decision to reduce by 20 per cent, the railroads decided in June to request an additional 5 per cent.

On eastbound business the roads decided to cut beans and peas from \$1.25½ to \$1.05, canned goods from \$1.20½ to \$1.05, and rice from \$1.25½, \$1.16½ and 1.08½, the rate depending upon the group to which shipped, to a flat rate of \$1 to A, B and C. Dried fruit in boxes was cut from \$1.66½ to \$1.25. These are radical reductions, of course, but let them be compared with the steamship rates: canned goods, 50 cents; beans, 55 cents; rice, 52½ cents (these rates were made for an emergency but have been extended); sacked and boxed fruit, 55 cents.

Export rates on goods moving via Gulf ports or via Mallory Line to New York have been cut. Boxed fruit is down from \$1.66½ to 95; sacked from \$2 to \$1.65, the old 20-cent differential being preserved; canned goods from \$1.20½ to 80; beans and peas from \$1.25½ to 90;

rice from 92 to 80, and barley from 74½ to 50. These reductions are forced by the competition of the direct steamship lines. Williams, Dimond & Company, operating the European-Pacific Line, have reduced dried fruit, sacked or boxed, to \$1.25, beans to \$1.20, canned goods to \$1, rice to \$1.05 and tallow to \$1; no minima to apply. The railroad rates are for carloads.

While they are endeavoring to build up export business to Europe, the roads also are continuing their efforts for the restoration of the old Pacific reduction of Pacific Coast import and export rates. Rates heretofore effective to and from Chicago only now will be applied to points on the following railroads: Toledo, St. Louis & Western; Chicago, Terre Haute & Southeastern; Detroit & Toledo Shore Line, and Ann Arbor. The concurrence of the first and last already had been announced. But despite the beginning thus made, it is impossible to overlook the fact that none of the large groups, such as the New York Central and Pennsylvania, has acceded.

Refrigerator Ships

The subject of refrigerator steamships for the intercoastal trade continues to bob up, and indications are that one or more companies may decide to establish such a service. Nothing has been done yet, however, despite published statements that the American Shipbuilding Company had decided to employ ten

3800 deadweight ton steamers in the trade under an arrangement with the California Fruit Growers' Exchange. The company has been considering that use of the vessels, but the announcement that it had come to a decision was premature.

The American-Hawaiian Steamship Company has had a refrigerator fleet under consideration for several months. Intimations received on the Pacific Coast from New York were to the effect that favorable action probably would be taken.

All steamship men do not see the question in the same light; some hold that the transportation of perishable Pacific Coast products to the East is primarily a function of the railroads. They argue thus: Refrigerated freight is of its nature perishable and, accordingly, demands a quick market, the more so because it is increasingly liable to deterioration after being removed from cars or steamships. This necessity of immediate sale forces the diversion of many refrigerator cars, which may be consigned to Council Bluffs or Omaha and upon or prior to arrival reconsigned to the Middle Western or Eastern city, whether St. Louis, Chicago, Cleveland or New York, that offers the best immediate market. The fact is, said one steamship man in discussing the question, that relatively few cars are delivered in the East without having been reconsigned at least once.

A steamship carrying a large refrigerator cargo, on the other hand, would be compelled to discharge the whole at one or two Atlantic ports. New York first, and perhaps Boston next, offer the best markets; but the discharge of a large amount of refrigerated freight at these ports probably would tend to create a glut, with the result that the goods would go begging, even though some city a few hundred miles inland might offer a good demand. The very bulk of the refrigerator cargo also would militate against a satisfactory sale. Relatively small lots shipped by rail may be scattered from Kansas City to Boston; the same potential market scarcely would offer to a complete cargo delivered as a whole.

Nor are existing storage facilities in New York adequate to care for such a movement of perishable freight as a refrigerator line would handle; and even the creation of facilities would not enable a refrigerator line to compete with the railroads because of the expense of water shipment, of discharging and storage,

or reloading and shipment by rail to the ultimate market.

The views presented here are held by a considerable number of shipping officials. Others, of course, think differently. The actual operation of a refrigerator line is the one proof of the pudding.

The Pacific Coast Producers' and Shippers' Association was organized at Seattle early in June with the object of obtaining better refrigerator facilities in the intercoastal trade. C. S. Whitcomb of Los Angeles, vice-president of the California Fruit Growers' Exchange, was elected president, and departed for New York on business for the new association. The organization says that its members are prepared to offer steamship lines a minimum of 9000 cars of fruit, but they are not willing to pay more than 90 cents a box. It is rather doubtful whether this rate would appeal to operators.

Freight Report

June 14, 1921.

Our last circular was dated May 11. Since that time a fair amount of business has been done in chartering, although the strike of engineers has been quite a factor in curtailing chartering vessels.

The Pacific Grain Company chartered steamer Benvenue for grain from Portland to U. K.-Continent at 58/6, option usual Mediterranean 2/6 additional, followed by the charter of the Benduran by Balfour, Guthrie & Company, at 60/- for one port U. K.-Continent, Bordeaux-Hamburg. Kerr-Gifford took the Port Said Maru at 58/- with the usual additional to Mediterranean. The Pacific Grain Company chartered steamer Natal at 58/9 for one port, 60/- two ports U. K.-Continent, Bordeaux-Hamburg, 62/6 usual Mediterranean. The Northern Grain & Warehouse Company chartered new tanker Swiftlight for two ports U. K.-Continent, Bordeaux-Hamburg, at 56/- and also Japanese steamer Ryfuku Maru at 57/6 for two ports U. K.-Continent, Bordeaux-Hamburg. Both the motorships Panama and Buenos Aires arranged space for wheat or flour from the North to Dantzig at 70/-. The Panama flour was by the Pacific Grain Company, and the Buenos Aires flour by the Sperry Flour Company. The Pacific Grain Company also chartered the British steamer Eastern Prince for U. K.-Continent, Bordeaux-Hamburg, usual Mediterranean, on private terms, and a Japanese steamer was reported as having been chartered at 55/- for one port, 56/3 two ports U. K.-Continent, option of 65/- one port; 67/6 two ports Baltic, or Nor-

way and Sweden. The break in exchange has weakened the demand somewhat, but we quote the market steady for grain from the North at 55/- bid, 57/6 asked.

From San Francisco no entire vessels have been fixed as yet, but the different shippers have arranged space on the regular liners on the basis of 60/- for U. K. or Continental ports, and one steamer, the Enley City, was forced to accept 57/6 for filling up space. The Buenos Aires also arranged space for about 4000 tons of cottonseed oil cake on the basis of \$13 per ton, weight, from San Pedro to Copenhagen.

For August loading some business has also been done for space on liners on the basis of 60/-.

At the present moment, we are not in position to report what action the Shipping Board will take in the matter of making rates for new crop loading. Now that the strike of the marine engineers is reported as being off, it may be that they will be ready to make rates, although we understand that, unless they can get 62 1/2 as a minimum, the vessels would go out at a loss, to U. K.-Continent.

Quite a demand has sprung up for lumber to New York. The steamer West Catana, which has just left this coast with lumber in that direction, has been chartered back to San Diego with coal by the Navy Department, and is again chartered for lumber to New York, this time at \$17.50, and the Munson Line have chartered three of their steamers to the Willapa Lumber Company at \$17. The Munaries and Mundelta so far have been named. There is still one more to be named.

Owing to the tieup of our steam schooners, the schooner Forest Friend was chartered by the Slade

Lumber Company for lumber from the North to San Francisco at a reported rate of \$8, and the Levi W. Ostrander was chartered from the North to Honolulu on private terms.

We forgot to say that from four to five steamers were chartered in May to carry wheat from Portland to Japan at \$7 per ton.

The schooner Fort Laramie was taken by Grace & Company for nitrate to the Hawaiian Islands at \$6.

Schooner Vancouver was chartered at \$18 with lumber from Puget Sound or Grays Harbor to Callao by W. L. Comyn & Company, and the Mohns Commercial Company chartered schooner Resolute for lumber from Grays Harbor to Callao at \$18.

Steamer Georgina Rolph was chartered on private terms on time, government form, in the Mexican trade, for from five to six months, the charterers having privilege of buying if they see fit.

At the close of this report, \$18 per thousand is offered firm for vessels of a million feet or more for lumber from the North to direct ports in Chile or Peru, and this is about the rate that charterers will pay for sailers to Australia, if they were obtainable; \$27.50 is about the rate which shippers would pay for Africa. The going rate for lumber to Japan and China by steamer is \$12.50. Of course, none of our sailers care to try to compete with steamers, as with the poor prospects of getting cargo back, they would be at a heavy loss.

Now that the engineers' strike is broken, and with the incoming crop of barley, we hope to see quite a movement in chartering from this coast to the different parts of the world. PAGE BROTHERS, Brokers.

In the Orient

Atlantic Tonnage Declines

An interesting feature of the April report of the Department of Communications of Japan is that Japanese vessels on the Orient-North Atlantic run decreased 48,074 gross tons during the month, the number at the end of April being 31 and their gross tonnage 188,925. Of all trade routes radiating from the United States, that to Japan was among the best, despite the severe panic that seized that country last year; but now, it appears, even the Atlantic-Orient business is following the Pacific into a de-

cline. It is evident, too, that the Japan-India trade is decreasing or, as is more probable, is being lost to the United Kingdom, as the Japanese tonnage engaged on that route decreased 30,180 tons during the month.

On the other hand, North China increased by 32,678 tons. If Dairen also is included in North China, the increase is not so remarkable, because Dairen began to enjoy a boom a few months ago, with the inevitable result, however, that too much tonnage began to flock thither. Even Manchuria has not unlimited quantities of soya bean oil.

At the end of April tied-up vessels numbered 135, ships of less than 100 gross being excluded, and the tonnage was 242,770, or 7.7 per cent of the entire merchant fleet, which is 3,150,000 tons, vessels of less than 100 being excluded. As compared with March, idle shipping had increased by 3500 tons but had decreased by 27 vessels, the latter showing being due to the employment of small vessels and the retiring of larger craft. Of the idle vessels, 51 steel steamers of more than 1000 gross accounted for 192,491 tons. The principal owners and the number of idle vessels of each were: Kokusai, 4 of 21,677 tons; Kiroumi, 6 of 21,432; Kishimoto, 5 of 20,843; Katsuda, 4 of 20,029; O. S. K., 2 of 15,561; Harata, 2 of 7203; N. Y. K., 3 of 6917; Mitsui, 5 of 6102; Hashimoto, 2 of 5464; Kobe Kisen, 4 of 4212. Sixty-one vessels were at Osaka, 18 at Kobe, 12 at Yokohama, 13 at Hakodate and the remainder scattered. Charters of six or more vessels were to expire during May.

Japanese Wage Reductions

More trouble appears to be in store for American operators who are endeavoring to compete with the Japanese. A report from Tokyo says that the Nippon Yusen Kaisha has decided to reduce wages of new men (presumably not of old employees, however) by 20 per cent, effective June 1. Ordinary seamen were not to be affected. In this connection Japanese authorities give the following comparative wage scales in yen for vessels engaged in European services:

	Japanese	British	American
Chief sailor.....	120	130	190
First helm-man.....	91	120	174
First sailor.....	77	110	170
Chief fireman.....	120	120	.....
Oilman.....	105	120	190
First fireman.....	77	120	180
Coal-man.....	63	110	150

It is estimated that the idle seamen of Japan number at least 15,000.

Earnings Decline

For the last business term the net earnings of the Nippon Yusen Kaisha fell off by yen 3,847,000 as compared with the preceding six months. The net profit, yen 5,541,878, was 19 per cent of the paid-up capital stock, which is yen 58,000,000. Although such a profit appears to be high, it should be remembered that the capitalization of the N. Y. K. does not begin to approximate the actual value of its property. A dividend of 25 per cent will be declared, it is anticipated,

by the use of yen 2,350,000 of the profit and loss account. This will permit of yen 487,158 being carried forward, as against yen 2,828,280 for the preceding six months.

A reduction of 20 per cent in passenger fares and freight rates to the East Coast of South America has been decided upon by the N. Y. K. and O. S. K. in order to meet foreign competition. On the other hand, the Australian conference is reported to be about to increase its Australia-Japan rates by 25 per cent or more. This action is due to the decline of the pound sterling, rates being in shillings, and is merely following the precedent already set in the case of Japan-Australia rates, which were increased 20 per cent several months ago. The general cargo rate will be 70 shillings as against 55.

The Matsuda Kisen Kaisha has reduced its capital from yen 2,500,000 to yen 1,250,000, following a reduction from yen 5,000,000 to yen 2,500,000 last year.

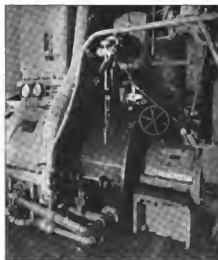
With the Builders

Six steel merchant vessels were launched during April, one by Harima (Suzuki), two by Osaka Iron Works, two by Yokohama Dock and one by Kawasaki. The total gross tonnage was 30,780. Three vessels were for the N. Y. K., one for the O. S. K. and the others for builders' account.

Japanese shipbuilders anticipate an early abolition of duties on shipbuilding materials, an act providing for which was passed by the last

Diet. Iron and steel, as well as machinery, etc., that cannot be manufactured in Japan, will be admitted duty-free. No immediate effect is anticipated, however, because building is so depressed that the abolition of tariffs cannot be of great avail. This year's tonnage output is estimated at about 200,000 gross, and next year's at not more than 100,000.

The Uchida shipyard, at Kanagawa, Yokohama, is represented as about to be sold to the Mitsui, although the reports are denied about as rapidly as they appear. The Uchida yard formerly was the Yokohama Engine & Iron Works and was the first engine-builder in the empire. It is engaged on naval work now.



G-E turbine and generator of the Shipping Board's electric-drive invincible

A Statement of Commercial Traffic Through the Panama Canal From Its Opening to Date.

Herewith is given a comparative statement of the commercial traffic passing through the Panama Canal from its opening on August 15, 1914, to March 31, 1921. In the instances where tonnage figures have been omitted, it is due to the incomplete records kept during the early years of Canal traffic.

	No. of ships.	TONNAGE.				Tolls	Tons of cargo.
		U.S. equiv.	P. C. net.	Reg. gross.	Reg. net.		
July, 1920.....	225	705,643	856,798	1,109,079	707,591	\$442,312.05	846,814
August, 1920.....	246	782,415	951,345	1,208,471	770,320	936,209.44	1,040,740
September, 1920.....	256	832,742	1,006,785	1,293,420	817,810	1,010,159.61	1,009,587
October, 1920.....	238	762,013	935,579	1,100,936	754,549	911,825.58	901,006
November, 1920.....	238	765,817	929,475	1,184,072	756,223	913,912.11	894,910
December, 1920.....	263	852,407	1,027,918	1,298,954	825,758	1,007,519.37	1,026,559
January, 1921.....	279	894,699	1,094,323	1,381,778	883,362	1,093,837.46	1,127,053
February, 1921.....	241	763,925	916,438	1,179,979	737,622	917,412.49	952,904
March, 1921.....	253	824,309	1,112,815	1,417,220	817,411	1,105,536.55	1,091,562
First 9 months of fiscal year 1921.....	2,263	7,263,960	8,874,279	11,265,869	7,178,427	8,761,065.63	9,204,144
Fiscal year 1920.....	2,478	7,099,230	8,546,044	11,059,319	7,037,875	8,513,933.15	9,374,499
Fiscal year 1919.....	2,028	5,193,812	6,145,094	7,826,903	5,612,929	6,172,829.59	6,546,563
Fiscal year 1918.....	2,069	5,440,114	6,446,673	9,371,319	5,917,319	6,438,853.35	7,532,001
Fiscal year 1917.....	1,806	.....	5,817,607	8,530,821	.....	5,621,781.66	7,093,015
Fiscal year 1916.....	760	.....	2,385,291	3,596,529	.....	2,399,820.42	3,063,371
Fiscal year 1915.....	1,072	.....	3,772,167	5,416,787	.....	4,313,353.69	4,926,145

* Canal was closed to traffic from September 15, 1915, to April 15, 1916.

* Canal was opened to commercial traffic August 15, 1914.

A statement of traffic from the Panama Canal Record. For April the statistics, as given in a later issue of the Record, are: Number of ships, 227; aggregate Panama Canal tonnage, 955,991; tons, 927,977.99; cargo carried, 97,615 long tons. The number of vessels and the tonnage carried were the smallest since July, 1920.

American Shipbuilding

On June 1 there were 28 steel merchant vessels of 310,790 dead-weight tons under construction in shipyards of the Pacific Coast of the United States, according to returns compiled by Pacific Marine Review. These totals represent a decline of seven vessels of 79,080 tons from those of May 1, no new contracts having been let to offset deliveries of that month.

During May the first of nine tankers for foreign account were completed, Standifer delivering two of 11,940 tons each to Imperial Oil and Union Construction one of 8400 tons to Anglo-Saxon Petroleum. One vessel of 8800 tons, the West O'Rowa, was delivered to the Shipping Board by Los Angeles. Other deliveries were to private owners.

One 8400-ton freighter was delivered by Canadian yards.

The following table shows construction as of June 1:

	No.	Agg'te
American Yards: Vessels	D. W.	
Freighters USSB.....	6	64,400
Tankers USSB.....	6	60,300
Tankers private.....	8	95,690
Freighters private	2	40,000
Tankers foreign.....	6	50,400
Totals.....	28	310,790
Canadian Yards:		
Freighters govt.....	4	33,480
Freighters private	1	600
Totals.....	5	34,080

Yards Finish Work

Mortality among shipyards has been great during the last few months. Several yards, in Canada and the United States, on the Pacific Coast, Great Lakes and Atlantic, have finished all the work that remained on hand.

With the delivery of two Imperial Oil tankers in June, the G. M. Standifer Construction Corporation, Vancouver, Washington, finished building. The Pacific Coast Shipbuilding Company, Bay Point, California, turned over the freighter Nashaba to the Shipping Board in June and prepared to close the yard. Northwest Bridge & Iron, Portland, Oregon, has delivered the tanker Swiftwind to Swiftsure Oil, leaving the Todd yard at Tacoma the one plant in the Northwest engaged on new steel work. The Swiftwind was the 228th vessel built on the Columbia and Willamette rivers since the beginning of war construction.

In Canada the Harbor Marine yard delivered its last vessel to the Canadian Government Merchant Marine

in April. Port Arthur, on the Canadian Lakes, completed its last for the Canadian government in May; and no less than four American yards on the Lakes were nearing the end. The Anchor yard, Washburn, Wisconsin, expected to deliver a ferryboat in late June, no other work remaining on hand; Defoe, Bay City, Michigan, finished the last mine-planter for the United States Army in May; with the delivery of a yacht to the Horace Dodge estate the Great Lakes yard completed its last work; and Saginaw already had wound up construction by delivering the Lake Miraflores to the Shipping Board in April.

On the Gulf, Doullut & Williams, New Orleans, delivered the last two of their Shipping Board program in May. Submarine Boat, Port Newark, New Jersey, was engaged on one vessel, a motorship for its own account, and had announced that it would engage in general engineering work.

Some New Work

Although no new contracts are being placed for large steel vessels, a little new work is being done. Announcements of recent barge contracts have been made by Dravo, Pittsburgh. The bureau of light-houses asked for bids for some new light vessels, and the United States engineers will build a drill boat to be used in improvement of the East River, New York. Some work may offer from the Navy soon, as twelve destroyers, one transport, and seven submarines remain to be built, authorization having been given but no contracts placed.

The Hawaiian Contract

Just when the Inter-Island Steam Navigation Company of Honolulu will take definite steps to place a contract for a new passenger vessel remains uncertain. James A. Kennedy, president of the company, returned to Honolulu after a short stay in San Francisco. With him went Captain Leb Curtis of Pillsbury & Curtis, who discussed a tentative plan with the directors. They were inclined to postpone building at this time because of the sugar situation in Hawaii, which is facing a decline of one-third to one-fourth of the normal output because of the indifferent attitude of Japanese labor. The directors did not formally postpone construction, however. Word now comes from Honolulu to the effect that officers of the company's fleet would be requested to consider the proposed

plan and make suggestions for improvements and that reports of the officers would be reviewed by the company and perhaps incorporated in a revised plan. Indications are, therefore, that construction may be delayed longer than was expected, but it is accepted as certain that a vessel will be built.

One consideration that the Inter-Island directors must bear in mind is that there is no time like the present. Shipbuilding is at a low ebb and yards need work badly, so that they are prepared to submit unusually low bids. Within a year, however, various factors probably would make for greater costs: many yards may have closed or definitely diverted their activities to construction other than shipbuilding, and those that do remain open probably will have much more repair work, provided general business improves, and therefore would not be so keenly desirous of getting a relatively small construction job.

No less than six yards of the Pacific and four of the Atlantic were preparing to bid. Such competition may not be seen again within a lifetime. Moreover, the Inter-Island needs a new passenger vessel for the Honolulu-Hilo trade and must build within a short time.

The Year in Canada

Statistics issued by the Department of Marine and Fisheries of Canada, placing the total gross tonnage built in 1920 at 204,635 tons, representing 351 vessels of one kind or another, show that the Canadian shipbuilding industry turned out a great deal more tonnage than seemed probable before these complete returns were available. The vessels built and registered in Canada during 1920 numbered 329, classified as follows: wooden sailing vessels 121, wooden steam vessels 53, wooden gas vessels 119, metal vessels—steam 35, gas 1. In point of gross tonnage the steam metal vessels led with 120,127 tons, followed by wooden sailing vessels, 22,758 tons; steam wooden vessels, 12,829 tons; gas wooden vessels, 3495 tons, gas metal vessels, 116 tons—total 159,325 gross tons.

The vessels built but not registered in Canada during the year were 22 in number, 13 of them being wooden steam vessels, 9 steel steam vessels and one wooden sailing vessel. The gross tonnage was: steel steam vessels, 31,135 tons; wooden steam vessels, 13,829 tons; wooden sailing vessels, 348 tons.

British Columbia, with 138 to her credit, led the provinces in the number of vessels turned out.

U. S. S. B. Repair Costs

The cost of maintaining the merchant ships owned by the United States is ranging around \$1,250,000 a month, says the Atlantic Coast Shipbuilders' Association. In the week ending May 7 201 ships of 1,404,841 deadweight tons were taken into repair yards. Thirty steamers were repaired abroad, the remainder in the United States. The record is as follows:

United States	171	1,175,715	\$259,995
European.....	16	120,058	64,833
Other foreign	14	109,068	12,966

Total..... 201 1,404,841 \$337,794

News of Eastern Yards

Baltimore

An order for a 350-ton deadweight motor tank barge has been placed with the Baltimore Drydocks & Shipbuilding Company by the Standard Oil Company of New Jersey. Gasoline or kerosene engines of 350-400 b. h. p. aggregate will propel this vessel.

The Lio, a 10,800-deadweight ton tanker, was launched from the south plant on June 4. The vessel is 430 feet in length, 59 feet beam, 33 feet 3 inches in depth; will have 2650 shaft horsepower; single screw; geared turbines; a speed of 10 knots; equipped with three Scotch boilers; oil-burning; forced-draft; having a cargo capacity of 3,000,000 gallons. The Tulsagas, another 10,300-deadweight ton tanker, recently launched from the south plant, returned May 26 from her trial trip.

Bethlehem

The Sparrows Point plant, Bethlehem, delivered the 8350-ton tanker Emile Deutsch de la Muerthe to the Lux Navigation Company in May. The 535 Palmetto State was launched June 4. The tanker Agwibay was launched at Fore River May 24.

Canadian Vickers

Canadian Vickers delivered the Ideford, a 6400-ton tanker for the Norwegian-American Line, June 6, and expects to deliver a sister, the Topdalsfjord, in July. The Topdalsfjord is the last vessel under construction.

Coastwise

As part of its general port development plan the city of Baltimore has purchased for \$212,500 the property of the Coastwise Shipbuilding Company, consisting of about seven acres of land. The site has a waterfront of 429.6 feet and adjoins the reclaimed area of the Mc-

Merchant vessels built in the United States (including a small tonnage for foreign owners) and officially numbered by the Commerce Department, Bureau of Navigation, during the 11 months ended May 31, 1921, comprised 1500 vessels of 2,369,450 gross tons, compared with 2232 of 3,890,554 gross tons for the 11 months ended May 31, 1920. Steel construction during the first five months of the calendar year 1921 was as follows: January, 30 vessels of 196,482 gross tons, including two concrete vessels of 7582 gross tons; February, 18 of 108,179; March, 23 of 140,374; April, 15 of 111,162; May, 15 of 115,312.

Comas street bulkhead. The whole area now controlled by the city at this point amounts to 70 acres. The plant of the Coastwise Shipbuilding Company, which was established in July, 1916, has six launching ways and specialized in schooners and schooner barges.

Dravo

The Dravo Contracting Company, Pittsburgh, has launched an all-steel platinum and gold dredge of dimensions 120 feet by 60 feet by 10 feet 6 inches; having a digging capacity of 7500 cubic yards a day. The gross tonnage is 588 tons, exclusive of machinery and equipment. The dredge is being constructed for the General Development Company of New York City and is for the South American operations of that company. It will be delivered, assembled complete, afloat at the Neville Island plant of the Dravo Company. The dredge will then be towed down the Ohio and Mississippi rivers to New Orleans, at which point it will be placed in the tow of a sea-going vessel for delivery to South America.

The Dravo Company will build three steel lighters for the Shipping Board, New York delivery.

Federal

Federal delivered the 15,000-ton tanker E. T. Bedford to the Standard Oil of New Jersey June 7. Two sisters will be completed in July. The keel of the Steel Seafarer for United States Steel Products was laid May 25; that of the Steel Pathfinder June 1, and that of the Steel Pioneer will be laid early in July.

Foundation

The French High Commission is offering for sale the Foundation Company Shipyard No. 12, located at New Orleans, where several 6000-ton steel vessels of the LeParmentier

type were built. The yard covers an area of 90 acres with a launching basin of 20 acres, the latter having a minimum depth of 25 feet. There are three launching ways.

Hog Island

The Buffalo Wrecking Company is dismantling the forty wooden ways of Hog Island. The work will require several months, as it involves the handling of about 5,690,000 feet of heavy lumber of the ways, towers and ramps. The government received about \$30,000 for it. Ten permanent ways, built of concrete, will be retained and the yard probably will be leased to private interests when business improves.

Jahncke

The Jahncke Drydock & Ship Repair Company, New Orleans, has purchased the Crescent City Machine & Manufacturing Works. P. A. DuBus, manager of this concern, becomes general manager of the Jahncke Company. In addition to the above, the Stern Foundry & Machinery Company of New Orleans, name, good-will, tools and equipment, has been sold to the Jahncke Company. The personnel of the Stern organization, however, will not be transferred. Arrangements have been made for the transfer of all machinery, tools and equipment of both concerns to the Jahncke Drydock & Ship Repair plant.

Lord

The Lord Drydock Corporation, which operates a completely equipped plant for the repairing of ships, including a 3500-ton Crandall marine railway, at Providence, Rhode Island, has opened its new plant on River Road, West New York, New Jersey, which will be the headquarters of the company in the future.

The West New York plant when completed will have a 100-ton stiff-leg derrick and six floating drydocks of from 1000 to 10,000 tons capacity, four of the docks now being in operation.

The plant is located on the west shore of the Hudson River, opposite Eighty-third street, Manhattan, and covers eighty-eight acres. There is a water frontage of 2000 feet on the property, on which has already been erected two piers. The complete project calls for five 1000-foot piers. The tracks of the West Shore Railroad serve these piers as well as other parts of the yard.

Merchant

Merchant launched the 10,000-ton tanker Playa for the Union Oil Company June 4. Following upon its recent entry into general engineering work, the Merchant yard has been

awarded a contract by the Fegles Construction Company, Minneapolis, to furnish certain fabricated steel for grain elevators being erected for the New York Barge Canal Company at Gowanus Bay, Brooklyn.

Newburgh

Shipping men of New York are showing great interest in the steamship Henry D. Whiton. This vessel, which has just been delivered to the Union Sulphur Company by her builders, the Newburgh Shipyards, is designed expressly for the transportation of sulphur in bulk, and in keeping with the nature of her cargo carries on her brimstone yellow smokestack the Union Sulphur Company's insignia of a "red devil" rampant.

The Henry D. Whiton is a twin-screw, single-deck vessel, 356 feet in length by 51 feet 6 inches breadth and 32 feet 5½ inches depth, and has a deadweight carrying capacity of 7346 tons on a draft of 25 feet 5½ inches. In her design and construction she presents many features that contribute to her efficiency in the loading, transportation and discharge of sulphur, while her unusually large water-ballast capacity will insure seaworthiness returning in ballast condition from European discharging ports. The triangular-shaped topside ballast tanks, running all fore and aft on each side of the vessel, make the cargo holds self-trimming and permit the holds to be entirely free from all obstructions, while contributing greatly to the longitudinal strength of the vessel.

The propelling machinery consists of a high and low pressure Parsons marine turbines, each driving a 14-foot propeller through a 36-to-1 reduction gear. These turbines are located one on port side and the other on starboard side, as far outboard as possible, by which the usual obstruction of shaft tunnels through cargo holds aft of machinery spaces is eliminated, and the two aft holds of the Henry D. Whiton can be unloaded by grab buckets with the same ease and facility as the two forward holds. Steam is supplied by three single-ended Scotch boilers, using fuel oil, and it is of interest to know that this vessel has sufficient fuel oil capacity to give her a steaming radius of 15,000 miles at 12 knots' speed.

Considerable attention has also been paid to the accommodations for both crew and officers. The crew are housed in commodious and well-ventilated quarters in the after deck house, while the officers' and engi-

neers' quarters are on the bridge deck.

Newport News

The Newport News Shipbuilding & Drydock Company, with a low bid of \$97,550, has been awarded the contract by the Shipping Board for alteration to be made to the new 535-foot passenger steamship Hawkeye State, operated by the Matson Line.

New York

Pennsylvania's namesake, the Keystone State, returned to the Camden yard of the New York Shipbuilding Corporation the afternoon of May 27 with brooms at its mastheads, symbolic of the liner's "clean sweep" in its two-day trial trip. The vessel covered 600 miles in its run. A speed of 19.75 knots was developed, with an average of 18.2. The contract maximum is 17.5. One hundred and thirty-seven guests were on the trial trip. The ship will be operated by the Admiral Line, Pacific Steamship Company, between Seattle and the Orient. She was the first vessel delivered by the South yard of the New York Ship.

The 12,550-ton tanker Empire Arrow, building for Standard Transportation, was launched May 24.

New York Navy Yard

The U. S. S. Tennessee, the latest electrically-propelled dreadnought, which was built at the New York Navy Yard, was given her final trials off Rockland during the latter part of May and passed them with complete success. Among the results obtained, the following are of special interest:

Her actual steam consumptions at various speeds were better than the Westinghouse Company's guarantees by 5 to 10 per cent.

The maximum speed developed was 21.378 knots.

She was brought to rest from top speed in less than three minutes. This is believed to be a record for so large a ship and is about the severest test that can be imposed upon her machinery, as the propellers were being operated astern while the ship was forging ahead.

The salvo test, the firing of all twelve 14-inch guns at once, caused no injury to her electrical equipment.

With astern operation of her propellers she developed 15 knots.

Her turning circle with all propellers operating forward and rudder hard-over is about 700 yards, which is hardly more than that of a destroyer.

It is stated that during the entire time of her trials that her Westinghouse electric propelling machin-

ery functioned perfectly, and that the superior maneuvering power which is claimed for the electric drive has been amply demonstrated.

The propelling machinery of the Tennessee consists of two 15,000-KVA Westinghouse turbo-generators and four 8375-H.P. Westinghouse propeller motors. Her length is 625 feet, beam 91 feet, and displacement 33,000 tons.

Shortly after her trials, she left the Atlantic Coast to join the Pacific fleet.

Staten Island

Staten Island launched the sugar vessel Dixiano for the American Sugar Refining Company May 21 and expected to make delivery in June. Two barges for Standard Oil of New York were launched in May and June, and the keel of a ferryboat for New York City was laid in May.

Submarine Boat

Following the lead of the Merchant Shipbuilding Corporation, which has gone in for general engineering in order to overcome the lack of orders for ship construction and marine engineering, the Submarine Boat Corporation, Newark Bay, New Jersey, is turning its attention to steel fabrication for land work, its initial contract being one for 1200 tons.

Sun

The Norwegian-America Line's new 10,000-ton tanker Foldenford was launched May 12 at the Sun Shipbuilding Company's yard, Chester, Pennsylvania. The Foldenford is the third Norwegian-America tank steamer to leave the ways in the past six months. After her trial trip, on which she averaged 11.84 knots, she was delivered May 31.

The 10,600-ton tanker David McKelvy, built for the Tidewater Oil Company, was launched June 4.

The Sun yard is reconditioning the Red D steamer Zulia at a cost of about \$100,000.

Texas

The Texas Steamship Company launched the tanker Illinois, 9600 deadweight tons, building for its own account, June 11.

Todd

The Todd Shipyards Corporation has added three floating docks to its extensive ship-repair facilities at New York. These additions give the five New York plants of the Todd Corporation a total of eighteen floating drydocks and two graving docks, the latter being the only graving docks, outside those in the Brooklyn Navy Yard, in New York harbor. With the three floating docks on the Pacific Coast at Seattle, the Todd

Corporation operates a total of twenty-three docks and is justly proud of being the largest and most complete ship repair organization in the world.

The three docks recently acquired have been divided between the plants of the Tebo Yacht Basin Company and Clinton Drydocks in Brooklyn, and the Tietjen and Lang Drydock Company in Hoboken.

It is not many years since the dis-

tinction of being the world's largest ship repair organization was claimed by an English company. By the building of new docks and the welding together of the principal repair yards in New York harbor into a compact and efficient organization, the Todd Shipyards Corporation has won an international reputation for speed and thoroughness in the building and repair of ships.

In Pacific Yards

Bethlehem

Bethlehem delivered the 10,100-ton tanker Hambro, the first of the sisters building for the Shipping Board, in June. The others, Hammac and Hamer, both of which were launched in May, are scheduled for late July delivery. The F. H. Hillman, the first of three 15,000-ton tankers for Standard Oil of California, will be launched in July.

Four destroyers, Farenholt, Sumner, Corry and Melvin, were delivered in May, the last on May 31. With that delivery the yard's program of sixty-six destroyers was closed. Thirty-six of the total were delivered in twelve months, which, in the absence of proof to the contrary, may well be accepted as an American record.

Kiangnan

The 10,000-ton freighter Celestial, the second of four building at the Kiangnan yard, Shanghai, for the Shipping Board, sailed in June for San Francisco, where delivery will be made by the Robert Dollar Company, representing the builder.

Los Angeles

Los Angeles Shipbuilding & Drydock Company delivered the West Lewark, an 11,000-ton freighter, to the Shipping Board in June. This vessel and her four sisters are the last cargo vessels building for the board on the Pacific Coast. The West Greylock was launched June 15.

Lieutenant M. B. Pollock, naval constructor assigned to duty in the plant of the Los Angeles Shipbuilding & Dry Dock Company to supervise dry docking and repairs of destroyers and Pacific fleet auxiliaries at that plant, is credited with the development of a particularly efficient system of handling each destroyer, with the result that through the co-operation of officials and personnel of the plant and of the commander, officers and crew of the ships to be docked, he has created a record of raising a destroyer, thoroughly cleaning the hull, painting it with two coats, cutting in the



Destroyer Farquhar, commanded by Lieutenant Commander R. G. Coman, undergoing a record painting in the Los Angeles drydock.

new water-line and undocking the ship, sending her on her way back to her base within the remarkably short space of five hours.

The destroyer Farquhar, commanded by Lieutenant Commander R. G. Coman, entered the drydock of the Los Angeles yard June 4, and was officially raised at 10:35 a. m. The hull-washing crew, in ten pontoons around the ship as the dock was being raised, scraped, wire-brushed and cleaned her "to a gantling." As she dried, the first coat of paint was applied to the entire hull and a new water-line cut in, her draft marks repainted, the second coat of paint applied over the first and at 3:33 p. m., the Farquhar again was afloat with the company's tug Bedford towing her clear of the dock and heading her seaward.

The Los Angeles yard's equipment permits of a destroyer leaving San Diego in the early morning, being raised, cleaned and painted with two coats and returning to be moored at her base again the same evening.

Moore

The last vessels under construction for the Shipping Board at the Moore yard, Oakland, were launched June 15 and christened Tustem and Lubrico. Each is a 10,000-ton tanker and a sister to the Bohemian Club. The 4750-ton motorship H. T. Harper was launched June 16 for the Standard Oil of California, which placed the motorship Charlie Watson, built by Union Construction, in service a few months ago. The Bohemian Club was to be delivered to the Shipping Board in late June.

Northwest Bridge

Northwest Bridge & Iron, Portland, delivered the 12,000-ton tanker Swiftwind to Swiftsure Oil in June. This was the last of seven sisters and the last steel vessel of any description under construction on the Columbia and Willamette.

Pacific Coast

Another yard completed its work when the Pacific Coast Shipbuilding Company, Bay Point, California, delivered the 9400-ton freighter Nashaba to the Shipping Board in June. With the exception of a small tanker for Associated Oil, all the yard's work was for the Shipping Board.

Peninsula

Ending its marine construction recently after a successful program as to workmanship and the development of its own design, the Peninsula Shipbuilding Company has decided to dispose of its plant at Portland, Oregon. The five-masted schooner Undaunted, which is being fitted out under the direction of G. F. Matthews, is the last ship at the yard. She will be ready for service in July. The Undaunted is one of the Shipping Board wood hulls that were left on the ways at the Grant Smith-Porter yard, Portland, and were taken over to join the commercial sailing fleet.

The Peninsula interests designed the Peninsula type of wood hull, a 4000-ton carrier when fitted as a steamer. Ten of them were finished for the Emergency Fleet Corporation. They were the only wood carriers of the war fleet turned out with turbine gear in the United States. Two hulls left on the ways when the war ended were changed into six-masted schooners and named Oregon Fir and Oregon Pine. Today they are rated the largest of their rig in the lumber trade of the Pacific and have proven smart sailers as well as economical carriers, each having loaded 2,200,000 feet of lumber on the maiden voyage. Before the war the Peninsula yard

turned out auxiliary schooners and that fleet was disposed of to Scandinavian and French owners.

Southwestern

Southwestern delivered the 8400-ton tanker Scopas to Dutch Shell in June. She was launched May 28. Her two sisters are scheduled for July and August delivery, and La Purissima, the other vessel under construction, for July launching and August delivery.

Union Construction

Union Construction laid the last

keel of its present program, that of the Coast Guard tug Shawnee, June 1, following the laying of the cutters Mojave and Modoc in April.

Wallace

The Wallace yard, Vancouver, B. C., delivered the 8400-ton freighter Canadian Skirmisher to the Canadian Government Merchant Marine on May 16. The Canadian Thrasher, which is being completed at the Prince Rupert yard by Wallace, will be launched about August 15.

Eastern Yard Reports

Atlantic and Gulf

AMERICAN BULK COMPANY, PITTSBURGH, PENN.

Purchasing Agent: W. G. A. Millar. Twenty-five coal barges Carnegie Steel Co; 175 LBP; 26 beam; 8 loaded draft; 4 launch Mar/21; 5 launch Apr/21; 3 launch May/21.

Six coal barges US War Dept; 145 LBP; 24 beam; 9 loaded draft; keel Mar/21; 3 launch May/21.

Three car floats undischarged interests; 285 LBP; 38 beam; 8 loaded draft; keel June/21, est; launch Aug/21, est; delivered Sept/21, est.

Two coal barges W. G. Coyle & Co, New Orleans; 175x26x8 loaded draft; launch and deliver July/21.

Two tow boat hulls Carnegie Steel Co; 149-2x34 4-5 loaded draft; launch and deliver Aug/21.

BATH IRON WORKS, BATH, MAINE

Purchasing Agent: J. L. P. Burke. Thomas P. Beal, hull 86, freighter Crowell & Thurlow; 395-6 LBP; 55 beam; 27-1 loaded draft; 10 loaded speed; 9600 DWT; Parsons geared turbine, 2100 SHP; 3 Scotch boilers, 15-6x11-6; keel Nov/20; launch June 16/21; deliver Aug/21, est.

BETHLEHEM SHIPBUILDING CORP., FORE RIVER PLANT, QUINCY, MASS.

Lexington, hull 1300, battle-cruiser U.S.N.

Raleigh, hull 1382, scout cruiser U.S.N.

Detroit, hull 1383, scout cruiser U.S.N.

Massachusetts, hull 1400, battle-ship U.S.N.

And the following nineteen submarines U.S.N.: AA-2, hull 1270; hulls 1309 to 1320 inc. submarines S-18 to S-29 inc; hulls 1389 to 1394 inc; submarines S-42 to S-47 inc.

Java Arrow, hull 1388, tanker Standard Trans Co; 468-6 LBP; 62-6 beam; 27 loaded draft; 11 loaded speed; 12,620 DWT; rec eng, 3200 IHP; 3 Scotch boilers, 15-3x11-6; keel May/17/20; launch Apr/30/21; deliver May/21.

Agwibay, hull 1395, tanker At-Gulf & W I S S Co; sister to above;

keel Aug/27/20; launch May/24/21. J. Fletcher Farrell, hull 1496, tanker Sinclair Nav Co; 430 LBP; 59 beam; 25-5 loaded draft; 11 loaded speed; 10,600 DWT; rec eng, 3200 IHP; 3 Scotch boilers, 15x11-9; launch June/10/21.

William Boyce Thompson, tanker Sinclair Nav Co; sister to above; keel Nov/11/20.

BETHLEHEM SHIPBLDG. CORP., SPARROWS POINT PLANT, SPARROWS POINT, MD.

Pine Tree State, hull 4195, combination USSB; 518 LBP; 72 beam; 30-7 loaded draft; 16 loaded speed; turb eng, 10,000 IHP; 8 Yarrows boilers; keel Feb/15/19; launch Mar 19/21.

Palmetto State, hull 4196; combination USSB; sister to above; keel Feb/19/19; launch June/4/21.

Nutmeg State, hull 4197, combination USSB; sister to above; keel July/29/20.

Emile Deutsch de la Meurthe, hull 4209, tanker Lux Nav Co; 412 LBP; 53-1 beam; 24-5 loaded draft; 11 loaded speed; 8400 DWT; rec eng, 2850 IHP; 3 Scotch boilers; keel Dec/14/20; launch Apr/16/21; deliver May/21.

International, hull 4210, ore and oil International Pet Co; 550 LBP; 72 beam; 32-4 loaded draft; 11 1/2 loaded speed; 20,000 DWT; rec eng 4600 IHP; 3 Scotch boilers, 17-6x12; keel July/22/20.

Bethore, hull 4211, ore and oil Ore SS Co; sister to above; keel Feb/24/21.

Marore, hull 4212, ore and oil Ore SS Co; sister to above, except turb eng; keel May/21.

Steelore, hull 4213, ore and oil Ore SS Co; sister to above; keel not laid.

CONSOLIDATED SHIPBUILDING CORPORATION, MORRIS HEIGHTS, N. Y.

Purchasing Agent: Wm. Rayner. Oak, hull 251, US lighthouse tender; 160 L.O.A.; 30 beam; 9-6 loaded draft; 875 DWT; TE eng, 700 IHP; 1 Scotch boiler, 14 diam; keel Nov 22/20; launch June 18/21.

Hawthorn, hull 252, US lighthouse tender; sister to above; keel Nov 22/20; launch June/21, est.

No name, hull 246, US lightship; 146-3 L.O.A.; 30 beam; 12-7 loaded draft; 825 DWT; comp eng, 400 IHP; 2 Scotch boilers, 10-6 diam; keel Mar/4/21; launch June/21, est.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO., PHILADELPHIA

Purchasing Agent: Ed. C. Geehr. Hull 448, scout cruiser USN; keel Feb/16/20.

Hull 449, scout cruiser USN; keel Mar/29/20.

Hull 501, scout cruiser USN; keel Aug/18/20.

Hull 502, scout cruiser USN; keel Aug/4/20.

Hull 503, scout cruiser USN; keel Oct/14/20.

Cuba, hull 505, passenger P&OSS Co; 325 LBP; 47 beam; 16 loaded draft; 16 loaded speed; 1100 DWT; 2-cyl TE eng, 1800 IHP each; 4 SE Scotch boilers, 12x14-6; keel May/3/20; launch Dec/11/20; deliver May 1/21.

OSCAR DANIELS COMPANY, TAMPA, FLORIDA

B. D. Benson, hull 11, Isherwood tanker Standard Oil; 466 LBP; 60 beam; 26-7 loaded draft; 10 1/2 loaded speed; 11,900 DWT; QE eng, 2800 IHP; 3 Scotch boilers, 15x11-6; keel June/29/20; launch Apr/15/21; deliver June/15/21, est.

T. J. Williams, hull 12, Isherwood tanker Standard Oil; sister to above; keel Aug/11/20; launch May/3/21; deliver Aug/15/21, est.

DOULLUT & WILLIAMS SHIP- BUILDING COMPANY, NEW ORLEANS

Ward, hull 1913, Isherwood SS for USSB; 395-6 LBP; 55 beam; 27 loaded draft; 11 loaded speed; 9600 DWT; turbine eng, 2800 IHP; 3 WT boilers, 9150 sq ft; keel Mar/25/20; launch Jan/22/21; deliver May/23/21.

Oldham, hull 1914; sister to above; keel Apr/17/20; launch Mar/19/21; deliver May/31/21.

FEDERAL SHIPBUILDING CO., KEARNY, N. J.

Purchasing Agent: J. L. Hastings. E. T. Bedford, hull 48, tanker for Standard Oil of NJ; 500 LBP; 68 beam; 27-6 loaded draft; 11 loaded speed; 15,000 DWT; rec engs, 3500 IHP; 3 Scotch boilers, 16 diam; keel July/23/20; launch May/17/21; deliver June 7/21.

Victrolite, hull 49, tanker Standard Oil of NJ; sister to above; keel July 22/20; launch June 14/21; deliver July/21/21, est.

J. A. Moffett Jr, tanker Standard Oil of NJ; sister to above; keel July 23/20; launch July/5/21, est; delivery July/22/21, est.

Steel Seafarer, hull 43, freighter US Steel Products Co; 425 LBP; 56 beam; 25-10 loaded draft; 12 loaded speed; 9400 DWT; turb engs, 3100 IHP; 3 Scotch boilers, 15 diam; keel May/25/21; launch Oct/15/21, est; deliver Nov/5/21, est.

Steel Pathfinder, hull 44, freighter US Steel Products Co; sister to the above; keel June/21; launch Nov 12/21, est; deliver Dec3/21, est.

Steel Pioneer, hull 45, freighter US Steel Products Co; sister to the above; keel July/21, est; launch Dec10/21, est; deliver Dec31/21, est.

GLOBE SHIPBUILDING & DRY-DOCK CO. OF MARYLAND, BALTIMORE

Purchasing Agent: H. B. McCauley. San Leopoldo, hull 101, oil carrier Eagle Oil Transport Co; 401 LBP; 54 beam; 25-1/2 loaded draft; 10 1/2 loaded speed; 8600 DWT; TE engs, 2800 IHP; 3 Scotch boilers, 15-3x 11-6; keel Sept/20; launch June25/21, est; deliver Aug15/21, est.

San Leonardo, hull 102, oil carrier Eagle Oil Transport Co; sister to above; keel Sept/20; launch July26/21, est; deliver Aug30/21, est.

LAKE TORPEDO BOAT CO., BRIDGEPORT, CONN.

Purchasing Agent: H. C. Stevens. S-48, hull 48, submarine USN. S-49, hull 49, submarine USN. S-50, hull 50, submarine USN. S-51, hull 51, submarine USN.

MERCHANT SHIPBUILDING CORPORATION, CHESTER, PENN.

Purchasing Agent: G. Coit. Puente, hull 381, tanker Union Oil Co; 424 LBP; 58 beam; 25-5 loaded draft; 10 1/2 loaded speed; 10,000 D WT; TE engs; 3 Scotch boilers, 15-3 x11-7; keel July 3/20; launch Apr 28/21; deliver June14/21.

Playa, hull 382, tanker Union Oil Co; sister to above; keel July22/20; launch June4/21.

Robert E. Hopkins, hull 383, tanker Tidewater Oil Co; sister to above; keel Aug30/20.

Samuel Q. Brown, hull 384, tanker Tidewater Oil Co; sister to above; keel Oct1/20.

No name, hull 385, freighter American-Hawaiian SS Co; 445 LBP; 59-8 beam; 28-6 loaded draft; 11 1/2 speed; 11,000 DWT; 2 6-cyl, 4-cycle Diesel engs, 4500 metric; 1 vertical donkey, 400 sq ft HS; keel Feb5/21; launch June21, est.

No name, hull 386, freighter American-Hawaiian SS Co; sister to above; keel Feb10/21; launch July21, est.

NAVY YARD, BOSTON

Pecos, fuel ship No. 18, USN; 455 LBP; 56-2 beam; 26-8 loaded draft; 14 loaded speed; 14,800 disp; rec eng, 5200 IHP; 4 Ward WT boilers; keel June2/20; launch Apr23/21; deliver Oct/21, est.

Whitney, destroyer tender No. 4 USN; 460 LBP; 60-11 beam; 21 loaded draft; 16 loaded speed; 10,600 disp; geared Parsons turbs, 7000 IHP; 2 WT exp small tube boilers; keel Apr23/21; launch Apr/22, est; deliver Oct/22, est.

NAVY YARD, PHILADELPHIA

Dobbin, hull 7, destroyer tender USN; 460 LBP; 60-10 beam; 21 load-

ed draft; 16 loaded speed; 10,600 tons disp; Parsons geared turb single screw engs, 7000 SHP; 2 WT boilers; keel Dec23/19; launch May 5/21; deliver date not determined.

Constitution, hull 8, battle cruiser USN; 850 LBP; 105-4 beam; 30-11 1/2 loaded draft; 33 1/2 loaded speed; 43,500 disp; electric drive, 180,000 SHP; 16 WT boilers; keel Sept25/20; launch and deliver dates not determined.

United States, hull 9, battle cruiser USN; 850 LBP; 105-4 beam; 30-11 1/2 loaded draft; 33 1/2 loaded speed; 43,500 disp; electric drive, 180,000 SHP; 16 WT boilers; keel Sept25/20; launch and deliver dates not determined.

NEW YORK SHIPBUILDING CORPORATION, CAMDEN, N. J.

Purchasing Agent: L. G. Buckwalter.

Southern Cross, hull 241, combination USSB; 534 LBP; 72 beam; 30-6 loaded draft; 18 loaded speed; 11,000 DWT; geared turbs, 12,000 SHP; 8 WT boilers; keel Aug/18; launch July20/19; deliver fall/21, est.

American Legion, hull 242, combination USSB; sister to above; keel Jan21/19; launch Oct11/20; deliver summer/21.

Blue Hen State, hull 250, combination USSB; sister to above; keel Mar 4/20; launch Feb23/21; deliver summer/21, est.

Bay State, hull 251, combination USSB; 534 LBP; 72 beam; 30-6 loaded draft; 18 loaded speed; 11,000 D WT; geared turbs, 12,000 SHP; 8 WT boilers; keel Oct15/19; launch July17/20; deliver winter/21, est.

Peninsula State, hull 252, combination USSB; sister to above; keel July20/20; launch Apr/21; deliver spring/22, est.

Keystone State, hull 253, combination USSB; sister to above; keel May13/19; launch May15/20; deliver May28/21.

Empire State, hull 254, combination USSB; sister to above; keel May 13/19; launch Aug4/20; deliver June 12/21.

Lone Star State, hull 255, combination USSB; sister to above; keel May 13/19; launch Oct23/20; deliver summer/21, est.

Hoosier State, hull 256, combination USSB; sister to above; keel May20/19; launch Oct23/20; deliver fall/21, est.

Yankee Arrow, hull 260, bulk oil Standard Trans Co of NY; 468 LBP; 62-6 beam; 27-0 1/2 loaded draft; 10 1/2 loaded speed; 12,550 DWT; 4 cyl QE engs, 3200 SHP; 3 SE Scotch boilers, 15-2x11-6; keel Aug17/20; launch Apr10/21; deliver summer/21, est.

Empire Arrow, hull 261, bulk oil Standard Trans of NY; sister to above; keel Sept14/20; launch May 24/21; deliver summer/21.

Levant Arrow, hull 262, bulk oil Standard Trans Co of NY; sister to

above; keel Nov4/20; launch fall/21, est; deliver winter/21, est.

No name, hull 263, combination Munson SS Co; 414 LBP; 57-6 beam; 23 loaded draft; 15 1/2 loaded speed; 4950 DWT; geared turbs, 5800 SHP; 5 SE Scotch boilers, 16-4x12-3; keel Sept30/20; launch summer/21, est; deliver winter/21, est.

No name, hull 264, bulk oil stock; 419-3 LBP; 56-3 beam; 25-9 1/2 loaded draft; 10 1/2 loaded speed; 9870 DWT; 3 cyl TE engs, 3000 SHP; 3 SE Scotch boilers, 15-10x11-4; keel Jan17/21; launch fall/21, est; deliver winter/21.

No name, hull 265, bulk oil stock; sister to above; keel spring/21, est; launch fall/21, est; deliver winter/21, est.

Dixie Arrow, hull 266, bulk oil Standard Trans Co of NY; 468 LBP; 62-6 beam; 27-0 1/2 loaded draft; 10 1/2 loaded speed; 12,550 DWT; 4 cyl QE engs, 3200 SHP; 3 SE Scotch boilers, 15-3 x11-6; keel Aug11/20; launch fall/21, est; deliver winter/21, est.

Saratoga, hull 199, battle cruiser USN; 874 LOA; 850 LBP; 105-3 1/2 extreme beam; 31 mean draft; 43,500 normal disp; 33 1/2 loaded speed; GE turbo-electric drive; 180,000 SH P; 16 WT boilers, 198,000 sq ft plus 18,000 superheat; keel Sept25/20.

Colorado, hull 200, battleship US N; 624 LOA; 606 LBP; 97-3 1/2 beam waterline; 30-6 mean draft; 32,600 normal disp; 21 loaded speed; Westinghouse turbo-electric drive, 28,900 SHP; 8 B&W WT boilers, 41,678 sq ft plus 4169 superheat; keel Mar29/19; launch Mar22/21.

Washington, hull 201, battleship USN; sister to above; keel June30/19; launch Sept/21, est.

Hull 267, fuel ship Japanese Navy; 497-8 LOA; 67 beam; 28 designed draft; 15 loaded speed; 13,000 DWT; elec drive, 8000 SHP; 4 B&W boilers; keel fall/21, est.

STANDARD SHIPBLDG. CORPN., SHOOTERS ISLAND, MARINERS HARBOR, N. Y.

Purchasing Agent: Jamie Cortada. Hull 32, fireboat City of New York; 121 LBP; 27 beam; 14-9 depth; 12 loaded speed; comp eng, 900 IHP; 2 B & W WT boilers, oil burning; keel Mar31/21; deliver Sept/21, est.

STATEN ISLAND SHIPBUILDING COMPANY, STATEN ISLAND, NEW YORK

Purchasing Agent: R. C. Miller. Diagono, hull 726, sugar ship Arn, Sug Ref Co; 365 LBP; 50 beam; 23 loaded draft; 10 loaded speed; 6300 DWT; TE eng, 2000 IHP; 2 Scotch boilers, 15x11; keel Sept9/20; launch May21/21; deliver June18/21, est.

Hell Gate, hull 728, dredge C. R. Browning; 140 LBP; 48 beam; 15 loaded draft; keel Aug28/20; launch Feb23/21.

Socony 113, hull 733, barge Stand Oil of NY; 258 LBP; 40 beam; 13 loaded draft; 2200 DWT; keel Dec 30/20; deliver June21.

Socony 114, hull 734, barge Stand Oil of NY; sister to above; keel Jan 10/21; deliver July 9/21, est.

Socony 115, hull 735, barge Stand Oil of NY; sister to above; keel Feb 26/21; deliver July 30/21, est.

Hull 736, tugboat Staples Trans Co; 136½ LBP; 27 beam; 16½ loaded draft; 10 loaded speed; 1 TE eng 700 HP; 1 Scotch boiler, 16x11½; keel May 16/21; launch July 30/21, est; deliver Sept 15/21, est.

Hull 737, ferryboat City of New York; 247 LBP; 66 beam; 19½ loaded draft; 15 loaded speed; 1 F&A comp eng, 3500 HP; 4 B&W WT boilers, 13,000 sq ft; keel May 23/21; launch Aug 15/21, est; deliver Oct 17/21, est.

Northwestern, tanker Am Pet Co; 242 LBP; 42 beam; 23 loaded draft; 10 loaded speed; TE eng; 2 Scotch boilers; lengthening job, additional 56 ft, making 2 new cargo tanks, 1000 DWT additional capacity. Vessel considered total loss by fire; raised; and now undergoing general repairs and at the same time lengthening. Job started May 31/21; estimated take 4 months.

SUBMARINE BOAT CORP., PORT NEWARK, N. J.

Purchasing Agent: W. C. Lawrence. Suphenco, hull 150, motorship Submarine Boat Corp; 324 LBP; 46-2 beam; 23 loaded draft; 11 loaded speed; 5350 DWT; keel May 29/20; launch Apr 12/21.

SUN SHIPBUILDING COMPANY, CHESTER, PENN.

Purchasing Agent: H. W. Scott. J. N. Pew, hull 39, tanker Sun Oil Co; 480 LBP; 65-9 beam; 26-7 loaded draft; 10½ loaded speed; 4300 DWT; single screw QE engs, 4300 IHP; 3 SE Scotch boilers, 15-10x 11-11½; keel Nov 5/20; launch Apr 23/21.

Argwharve, hull 40, tanker A. G. W. I. S. Co; 480 LBP; 65-9 beam; 26-7 loaded draft; 12 loaded speed; 12,500 DWT; single screw QE engs, 4300 IHP; 4 SE Scotch boilers, 15-10x 11-11½; keel Nov 26/20; launch Apr 2/21.

Argwimex, hull 41, tanker A. G. W. I. S. Co; sister to above; keel Dec 8/20; launch May 21/21, est; deliver July 21/21, est.

Argwiscot, hull 42, tanker A. G. W. I. S. Co; sister to above; keel Dec 23/20; launch July 2/21, est; deliver July 30/21, est.

Argwistates, hull 43, tanker A. G. W. I. S. Co; sister to above; keel Jan 3/21; launch July 16/21, est; deliver Aug 15/21, est.

Hull 44, tanker Benham & Boyesen, Inc; 430 LBP; 59 beam; 25-7 loaded draft; 11 loaded speed; 10,600 DWT; TE engs, 2600 IHP, est; 3 SE Scotch boilers, 15-10x11-11½; keel Jan 12/21; launch May 12/21; deliver June 1/21.

David McKelvy, hull 45, tanker Tidewater Oil Co; sister to above, except loaded speed is 10½; keel

Feb 23/21; launch June 4/21; deliver June 30/21, est.

No name, hull 46, tanker Sun Oil Co; 480 LBP; 65-9 beam; 26-7 loaded draft; 10½ loaded speed; 12,800 DWT; single screw QE engs, 4300 IHP; 3 SE Scotch boilers, 15x11-11½; keel Apr 21; launch Aug 30/21, est; deliver Sept 30/21, est.

No name, hull 47, tanker Sun Oil Co; sister to above; keel Apr 21; launch Sept 3/21, est; deliver Oct 3/21, est.

TERRY SHIPBUILDING CORP., SAVANNAH

Purchasing Agent: H. A. Bittner. Hull 69, oil-barge builders' acct; 285 LBP; 44 beam; 21 loaded draft; 3500 DWT.

Hulls 70, 71, 72; sisters to above; work suspended.

TEXAS STEAMSHIP COMPANY, BATH, MAINE

Purchasing Agent: A. R. Weber. Illinois, hull 31, tanker Texas S S Co; 415-10 LBP; 56 beam; 25-7½ loaded draft; 11½ loaded speed; 9600 DWT; TE engs, 3000 IHP; 3 Scotch boilers, 15-3x11; keel Oct 19/20; launch June 11/21.

No name, hull 32, tanker Texas S S Co; sister to above; keel Nov 10/20.

American Lakes

ANCHOR SHIPBUILDING CO., WASHBURN, WIS.

Purchasing Agent: Geo. F. Morgan. Double ended ferry, no name, Hudson & Athens Ferry Co; 113 LBP; 33 beam; 7 loaded draft; 8 loaded speed; Ingersoll-Rand Diesel engs, 300 IHP; keel Feb 21; launch May/21; deliver June 28/21, est.

DEFOE SHIPBUILDING CO., BAY CITY, MICH.

Purchasing Agent: A. D. Defoe. Major William P. Pence, hull 56, mine planter US Govt; 100 LBP; 22 beam; 11 loaded draft; 12 loaded speed; comp eng, 350 IHP; 1 WT boiler; deliver May 21.

Captain Clarence M. Condon, hull 57, mine planter US; sister to the above; deliver May 21.

Captain John W. McKie, hull 58, mine planter US; sister to above; deliver May 21.

Canadian

CANADIAN VICKERS, LTD., MONTREAL

Purchasing Agent: H. Graham. Idefjord, hull 81, single-screw steel two-deck cargo Norwegian-America Line; 365 LBP; 49½ beam; 29 loaded draft; 11½ loaded speed; 6400 DWT; TE engs, 2600 IHP; 3 Scotch boilers, 14-9 with superheaters; keel May 8/20; launch Apr 9/21; deliver June 2/21.

Tordalsfjord, hull 82, Norwegian America Line; sister to above; keel July 29/20; launch May 5/21; deliver July 21, est.

DAVIE SHIPBUILDING & REPAIRING COMPANY, LTD., LAUZON LEVIS, P. Q., CANADA

Purchasing Agent: N. W. Van Wyck.

Canadian Challenger, hull 476, single-screw cargo Canadian government; 400 LBP; 52 beam; 25-3 loaded draft; 11½ loaded speed; 8350 DWT; TE surface cond engs, 3000 IHP; 3 Scotch marine boilers, 15-6x 11-6; keel May 14/20; launch June 2/21, est.

PORT ARTHUR SHIPBUILDING COMPANY, PORT ARTHUR, ONTARIO

Purchasing Agent: N. S. Thrasher, Cleveland, Ohio.

Canadian Harvester, hull 45, double-deck ocean freighter Canadian government merchant marine; 251 L BP; 43-6 beam; 22-3 loaded draft; 10 loaded speed; 3550 DWT, est; 3 cyl TE 18-30-50x36 engs, 1250 IHP; 2 Scotch boilers, 16x10-9; keel Mar 30/20; launch Nov 20/20; deliver May 17/21.

Miscellaneous Construction

COLUMBIA STEEL COMPANY, PITTSBURGH, CALIF.

Steel castings for many steel vessels now under construction in the Pacific Coast yards, including the dreadnought Montana and the sister ships 49, 50, 52; also for Coast Guard cutters under construction in the Union Const. Co. yard.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO., PHILADELPHIA

Twelve Parsons manganese bronze propellers for scout cruisers 4, 5 and 6 building by Todd Drydock & Const. Corp., Tacoma. Two right-hand and two left-hand propellers for each vessel. Weight of propellers 13,200 pounds each; diameter 11-3; pitch 11-10.

ALLAN CUNNINGHAM COMPANY, SEATTLE

On order and under construction: 6 steam and electric steering gears; 13 steam and electric anchor windlasses; 18 steam and electric and hydro-electric and hand capstans; 37 steam and electric winches.

DOW PUMP & DIESEL ENGINE COMPANY, ALAMEDA

H. T. Harper, motorship Standard Oil Co; one 200 IHP, two 267 IHP Diesel auxiliary electric drive engs.

JAMES C. H. FERGUSON, SALES AGENT, MONADNOSCO BLDG., SAN FRANCISCO

American Engineering Co.: Four steering engines, ferries Newark and Piedmont; electric capstans drydock Moore; hydraulic telemotor, hull 2077, Moore; 3 towing machines, 4 steering engines, Shipowners & Merchants' Tugboat Co. Pneumercator Co.: 116 pneumer-

cators USS California, Mare Island; 40 for 4 Coast Guard cutters, Union Construction; 10 for West Lewark, West Falaron, West Greylock, West Prospect, West Chopaka, Los Angeles; 60 for 12 submarines USN, Bethlehem; 2 for SS Mandarin.

Rostand Mfg. Co.: air ports and lenses complete 4 Coast Guard cutters and 4 Anglo-Saxon tankers, Union Construction Co.

FORD & GEIRRIE, AGENTS, SAN FRANCISCO

National stockless anchors, Upon Walton Co., for hull 165 at Moore's; Dean feed pumps, Dean Bros' Steam Pump Works, for 166 at Moore's; Reliance forced draft equipment, Jno Reid & Co., for hulls 165, 166 at Moore's; National stockless anchors Upon Walton Co., hull 166, Moore's; Dean feed pumps, Dean Bros' Steam Pump Works, hull 23, Southwestern; Willett Bruce whistle control, McNab Co., hulls 16, 17, 18, 19, Union Construction; McNab direction indicators, McNab Co., hulls 16, 17, 18, 19, Union Construction; Reliance forced draft equipment, John Reid & Co., hull 23, Southwestern; Anchor chain, Lebanon Chain Co., hull 23, Southwestern; windlass, gypsy and steering gear, Hyde Windlass Co., hull 20, Union Construction; Welin davits, American Balsa Co., hulls 5311-2-3, Bethlehem, hull 163, Moore; Reliance furnace fronts, John Reid & Co., hulls 2862-3-4, Moore; Willett-Bruce whistle control, McNab Co., hulls 5311-2-3, Bethlehem; McNab direction indicator, hulls 31-2-3-4-5, Los Angeles; Balsa wood for cold storage, American Balsa Co., hulls

5311-2-3, Bethlehem; Welin davits, American Balsa Co., hulls 2862-3-4 and hull 165, Moore; White fuel oil burners, Todd Dry Docks, hull 165, Moore; Mills releasing gear, hulls 24-5-6, Southwestern; Broady releasing gear, hull 165, Moore.

LIDGERWOOD MFG. COMPANY, NEW YORK, SAN FRAN- CISCO, LOS ANGELES

One 10x10 inch screw gear steering engine for USS Holland building at Puget Sound Navy Yard.

MARINE IRON WORKS, CHICAGO

Five hundred special ice machines.

SKANDIA PACIFIC OIL ENGINE COMPANY, OAKLAND

Purchasing Agent: A. Bolander. Ten 850 BHP Werspoor Diesel engs building for USSB; 6 cyl, 135 RPM; six delivered.

Ten 140 BHP 4-cylinder Skandia engs for self-propelling barges on Erie Canal; all delivered.

Fifteen 16 BHP 1-cylinder Skandia engs, auxiliaries for above; all delivered.

One 100 BHP 2-cylinder Skandia eng for river freighter for N. Fay & Son; delivered.

STEWART DAVIT & EQUIPMENT CORP., NEW YORK, SAN FRANCISCO, SEATTLE

Stewart davits are being installed in the following: At Union Coast Co: Coast Guard cutters, hulls 16, 17, 18, 19; Canadian Pacific lines, Wallace yard, Vancouver; Matson SS Enterprise, Moore yard; hull 166, Vacuum Oil, Moore yard.

holt, May 10; Corry, May 25; Sumner, May 26; Melvin, May 31.

Submarines USN: S-31, hull 136; S-32, hull 137; S-33, hull 138; S-34, hull 139; S-35, hull 140; S-36, hull 141; S-37, hull 142; S-38, hull 143; S-39, hull 144; S-40, hull 145; launch Jan/5/21; S-41, hull 146.

HANLON DRYDOCK & SHIP- BUILDING CO, OAKLAND

Purchasing Agent: R. Barker. Dan F. Hanlon, hull 89, steam schr. D. J. Hanlon; 2500 DWT; 1400 IHP engines; 2 B&W boilers.

LOS ANGELES SHIPBUILDING & DRYDOCK CO., SAN PEDRO

West Lewark, hull 31, steel cargo USSB; 430 LBP; 54 beam; 28-2 loaded draft; 10 1/2" loaded speed; 11,000 DWT; TE engs, 3500 IHP; 3 Scotch single end, 15-9; keel July/30/20; launch Feb/24/21; deliver June/21.

West Falaron, hull 32, steel cargo USSB; sister to above; keel Sept/27/20; launch Apr/19/21; deliver July 15/21, est.

West Greylock, hull 33, steel cargo USSB; sister to above; keel Nov/10/20; launch June/21; deliver Aug/9/21, est.

West Prospect, hull 34, steel cargo USSB; sister to above; keel Dec/31/20; launch July/13/21, est; deliver Sept/14/21, est.

West Chopaka, hull 35, steel cargo USSB; sister to above; keel Feb/24/21; launch Sept/6/21, est; deliver Nov/25/21, est.

MOORE SHIPBUILDING COM- PANY, OAKLAND

Purchasing Agent: W. E. Hostetter. Bohemian Club, hull 2862, tanker USSB; 425 LBP; 57 beam; 26 loaded draft; 10,000 DWT; rec eng; three Scotch boilers, 15-2x11; keel Oct/23/20; launch May/14/21; deliver June 25/21, est.

Tustum, hull 2863, tanker USSB; sister to the above; keel Nov/24/20; launch June/15/21; deliver Aug/25/21, estimated.

Lubric, hull 2864, tanker USSB; sister to above; keel Jan/21/21; launch June/15/21; deliver Aug/30/21, est.

H. T. Harper, hull 163, tanker Standard Oil Co of California; 339 LBP; 46 beam; 21-6 loaded draft; 4750 DWT; Skandia Diesel engs; keel Oct/20/20; launch June/21/21; deliver July/15/21, est.

Tamihua, hull 165, tanker S. P. Atlantic S S Co; 520 LBP; 71 beam; 28 loaded draft; 16,340 DWT; rec engs; 3 Scotch boilers, 15-9x12; keel Feb/28/21; launch July/2-21; est; deliver Aug/6/21, est.

S. S. Birkenhead, hull 166, tanker Vacuum Oil Co; 425 LBP; 57 beam; 26-3 loaded draft; 10,100 DWT; rec engs; 3 Scotch marine boilers, 15-2x12; keel Dec/9/20; launch July/12/21, est; deliver Aug/20/21, est.

NAVY YARD, PUGET SOUND

Medusa, repair ship for government; 460 LBP; 70 beam; about 19 loaded draft; 17-5 loaded speed; turbine eng, 7000 IHP; 2 WT express

Returns of the West Coast

United States

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Potrero Works

Purchasing Agent: O. W. Street. Hammac, hull 5274, tanker USSB; 435 LBP; 56 beam; 26 loaded draft; 11 loaded speed; 10,100 DWT; rec engs, 2600 IHP; 3 Scotch marine boilers, 15x11-9; launch May/25/21; deliver July/20/21, est.

Alameda Works

Hambro, hull 5272, tanker USSB; 435 LBP; 56 beam; 26 loaded draft; 11 loaded speed; 10,100 DWT; rec engs, 2700 IHP; 3 Scotch marine boilers, 15x11-9; keel Sept/8/20; launch Apr/15/21; deliver June/21.

Hamer, hull 5273, tanker USSB; sister to Hambro; keel Nov/1/20; launch May/21/21; deliver July/30/21, estimated.

Chilore, hull 5309, combination ore and coal carrier Ore Steamship Co; 571-6 LOA; 550-1 LBP; 72 molded beam; 44 molded depth; 32-4 loaded draft; 11 1/2 loaded speed; 20,000 DWT; Curtis turbines with Falk reduction gears, 5000 SHP; 3 Scotch SE boilers, 17-6x12, each 4287 sq ft;

oil burners; keel July/21, est; launch Oct/21, est; deliver Jan/22, est.

Lebore, hull 5310, combination ore and coal carrier Ore Steamship Co; sister to above; keel July/21, est; launch Nov/21, est; deliver Feb/22, estimated.

F. H. Hillman, hull 5311, tanker Stand Oil Co of Cal; 500 LBP; 68 beam; 25-11 loaded draft; 11 loaded speed; 15,000 DWT; rec engs, 4000 IHP; 3 Scotch marine boilers, 16x12-9; keel Jan/10/21; launch July/21, est; deliver Aug/15/21, est.

H. M. Storey, hull 5312, tanker Stand Oil Co of Cal; sister to F. H. Hillman; keel Jan/19/21; launch July 15/21, est; deliver Sept/1/21, est.

W. S. Rheem, hull 5313, tanker Stand Oil Co of Cal; sister to F. H. Hillman; keel Mar/1/21; launch July 31/21, est; deliver Sept/1/21, est.

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Potrero Works

Naval Works

Destroyers USN: 310 LBP; 30-11 1/2 beam; 9-4 loaded draft; 35 loaded speed; 1308 tons; turbine engs, 27,000 IHP; 4 Yarrow boilers. Last four delivered as follows: Faren-

type boilers; 10,000 tons disp; keel Jan2/20; launch and deliver dates not set.

Holland, submarine tender for government; 460 LBP; 61 beam; about 20 loaded draft; 16 K loaded speed; turbine eng, 7000 IHP; two WT express type boilers; 10,000 tons disp; keel April1/21.

NAVY YARD, MARE ISLAND

California, battleship USN; 600 L BP; 97-31½ beam; 30-3 loaded draft; 21 loaded speed; 32,300 disp; turbo-electric engs, 26,800 SHP; 8 Bu's express boilers, 50,984 sq ft; keel Oct 25/16; launch Nov20/19; deliver July or Aug/21.

Montana, battleship USN; 660 L BP; 105 beam; 33 loaded draft; 23 loaded speed; 42,200 disp; turbo-electric engs, 40,000 SHP; 12 Bu's express boilers, 74,040 sq ft; keel Sept 1/20.

Wasmuth, destroyer USN; 310 L BP; 30-11½ beam; 9-4 loaded draft; 35 loaded speed; 1215 disp; geared turbine eng, 26,000 SHP; 4 Normand boilers, 27,000 sq ft; keel Aug12/19; launch Sept15/20.

Trevel, destroyer USN; sister to above; keel Aug12/19; launch Sept 15/20.

Perry, destroyer USN; sister to above; keel Sept15/20.

Decatur, destroyer USN; sister to above; keel Sept15/20.

NORTHWEST BRIDGE & IRON CO., PORTLAND

Purchasing Agent: W. C. Smith. Swiftwind, tanker Swiftsure Oil Trans Co (France & Canada S S Co); 12,000 DWT; shelter deck; Isherwood system; 465-7 LBP; 60 beam; 26-3 loaded draft; 10½ loaded speed; TE eng, 3150 IHP; 3 Scotch boilers, 15-5½x11-9; launch May19/21; deliver June/21.

PACIFIC COAST SHIPBUILDING CO., BAY POINT

Purchasing Agent: J. A. Smiley. Nashaba, hull 950, steel cargo US SB; 402-6 LBP; 53 beam; 26-6 loaded draft; 9400 DWT turb eng, 2800 IHP; 3 Scotch boilers, 11x15-6; keel Aug25/19; launch Mar24/21; deliver June/21.

SOUTHWESTERN SHIPBUILDING CO., EAST SAN PEDRO

Purchasing Agent: J. J. Wilson. La Purisima, hull 23, Isherwood tanker Union Oil Co; 392 LBP; 51 beam; 23-11 loaded draft; 11½ loaded speed; 7500 DWT; TE engs, 2800 IHP; 3 Scotch boilers, 14x12; keel Dec22/20; launch July 21, est; deliver Aug/21.

Scopas, hull 24, Isherwood tanker Nederlandsch-Indische Tankstoomboot Maatschappij; 412 L BP; 53 beam; 24-7 loaded draft; 11 loaded speed; 8400 DWT; TE engs, 2800 IHP; 3 Scotch boilers, 15-6x11-7; keel Oct20/20; launch May28/21; deliver June/21.

Silvanus, hull 25, Isherwood tanker Nederlandsch-Indische Tankstoom-

boot Maatschappij; same as above; keel Oct20/20; launch June/21, est; deliver July/21, est.

Semiramis, hull 26, Isherwood tanker Nederlandsch-Indische Tankstoomboot Maatschappij; same as above; keel Nov5/20; launch July/21, est; deliver Aug/21, est.

TODD DRYDOCK & CONSTRUCTION CORP., TACOMA

Purchasing Agent: C. L. Banks. Omaha, hull 100, scout cruiser USN; 555-6 LOA; 550 LBP; extreme beam 55-4; molded beam 54-9; depth molded 26; mean loaded draft 13-6; disp 7100 tons; Westinghouse Parsons turbines and reduction gear, 105,000 IHP; designated speed 34; 12 Yarrows WT boilers; keel Dec6/18; launch Dec14/20.

Milwaukee, hull 106, scout cruiser USN; sister to above; keel Dec13/18; launch Mar24/21.

Cincinnati, hull 107, scout cruiser USN; sister to above; keel May15/20; launch May23/21.

UNION CONSTRUCTION CO., OAKLAND

Tampa, hull 16, cutter USCG; 240 LOA; 39 beam; 14 loaded draft; 16 loaded speed; 1600 DWT; turbo-electric engs, 2600 IHP; 2 WT boilers; keel Sept27/20; launch April6/21.

Haida, hull 17, cutter for USCG; same as the above; keel Sept27/20; launch April9/21.

Mojave, hull 18, cutter USCG; same as the above; keel April6/21; launch Sept10/21.

Modoc, hull 19, cutter USCG; same as above; keel April9/21; launch Sept10/21, est.

Shawnee, hull 20, cutter USCG; 150 L O A; 30 beam; 13-6 loaded draft; 12½ loaded speed; 1000 DWT; rec engs, 1000 IHP; 2 WT boilers; keel June1/21.

Achatina, hull 21, oil tanker Anglo-Saxon Pet Corp, Ltd; 412 LBP; 53-6 beam; 24-9 loaded draft; 11 loaded speed; 8400 DWT; rec engs, 2600 IHP; 3 Scotch marine boilers, 15-6x11-7; keel Dec15/20; launch May21/21.

Ampullaria, hull 22, oil tanker Anglo-Saxon Pet Corp, Ltd; sister to Achatina; keel Feb 5/21; launch June20/21.

Amalthus, hull 23, oil tanker Anglo-Saxon Pet Corp, Ltd; sister to Achatina; keel Mar 12/21; launch July15/21, est.

All cutters on transverse system; others on Isherwood system.

Canadian

CHOLBERG SHIPYARD, VANCOUVER, B. C.

Purchasing Agent: W. Meed. Sir Henry Drayton, hull 5, 4-masted barkentine Victoria Shipowners, Ltd; 250 LOA; 45-6 beam; 21-10 loaded draft; 2400 DWT; sailing vessel; shaft logs fitted for auxiliary but no machinery installed; keel May 15/20; launch Aug1/21, est.

No name, hull 6, 4-masted barkentine Victoria Shipowners, Ltd; sister to above; keel June4/20; launch Oct 1/21, est.

No name, hull 7, 4-masted barkentine Victoria Shipowners, Ltd; sister to above; keel Feb/21.

J. COUGHLAN & SONS, LTD., VANCOUVER, B. C.

Purchasing Agent: J. Joseph. Canadian Transporter, hull 20, steel freighter Canadian government; 400 LBP; 52 beam; 25-3 loaded draft; 11½ loaded speed; 8350 DWT; TE eng, 3000 IHP; 3 Scotch boilers, 15-6x11-6; keel Jan6/21.

Canadian Freighter, hull 21, steel freighter Canadian government; sister to above; keel Jan6/21.

PRINCE RUPERT DRYDOCK & ENGINEERING COMPANY, PRINCE RUPERT

Canadian Scottish, steel cargo Canadian government; 8390 DWT; 2-deck; bridge, poop and forecastle; 11 speed; keel Sept27/19; launch May17/21.

Canadian Thrasher, steel cargo Canadian government; 8390 DWT; 2-deck; bridge, poop and forecastle; 11 speed; keel Oct20/19; launch Aug 15/21, est.

These vessels are being completed by the Wallace Shipbuilding & Drydock Co, North Vancouver. The terms are time and material plus 8 per cent.

WALLACE SHIPBUILDING & DRYDOCK CO., VANCOUVER, B. C.

Canadian Skirmisher, cargo Canadian government; 8400 DWT; 413 long; 52 beam; 31 deep; 11½ loaded speed; keel Oct/20; launch Mar17/21; deliver May16/21.

Coastwise steamship Canadian Pacific; 317 LBP; 48 beam; 18½ deep; 16 knots; single-screw; 600 tons cargo space; accommodations for 200 passengers; keel Oct/20.

This company also will complete the Canadian government steamships Canadian Reeper and Canadian Thrasher, each of about 8400 tons deadweight, work on which was suspended when the Prince Rupert Drydock & Engineering Company went into the hands of a receiver.

Drydocking and Repairs

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Potrero Works

Miscellaneous repairs: Shabonee (also retubing main condenser), Steel Age, Golden State, Newport, La Brea (also repairs to fuel tank bulkhead, installation of grease extractor), Banter, Buford, Santa Inez, San Jose, Barge No. 4, Eastern Importer. New crankshaft: Barge Olinda. Miscellaneous repairs, drydocking, painting: Coalanga (also making and installing 2 capstans), Arctic, Bangor, Brandon, Atlas, Colusa, Rosamond. Repairs to stern

Snap Along the Waterfront



Left to right, top row: Pacific Mail passenger liner Golden State; interior reception hall Golden State; scene on San Francisco's Embarcadero. Second row: Pacific Mail liner Venezuela; Pacific Mail passenger and cargo liner Wolverine State; Admiral Line's coasting passenger steamer President. Third row: Japanese freighter Durban Maru; General Steamship freighter Meriden; Isthmian Line freighter Steel Age. Fourth row: Mystery speed boat Lillian; American-Hawaiian freighter Iowa; Pacific Mail freight and passenger liner Circle Star. Fifth row: Swedish motorship Borgland; U. S. Shipping Board tanker Stockton; Dutch freight steamer Hall. Sixth row: Swedish motorship Buenos Aires; Oriental immigrants watchfully waiting; Toyo Kisen Kaisha steamer Mayo Maru.

Photographs by J. P. Crotty.

wheel: Potrero. New feed pump bodies: West Hixton, Las Vegas, West Holbrook. New tailshaft: F. S. Loop. Engine, boiler, hull repairs: Marama. Overhauling sea valves, drydocking, painting: Nashaba. Engine and hull repairs, drydocking, painting: Borgland, La Habra (also boiler repairs). Caulking decks: Wolverine State. New propeller blades: D. G. Scofield.

Alameda Works

Miscellaneous repairs: Katherine, Davenport, Liverton, Angel Island, Solano, Pacific, Daisy Freeman, Phyllis. Drydocking, miscellaneous repairs, new propeller: Idaho. Miscellaneous repairs, drydocking, painting: F. S. Loop, Stanwood, Quinault (new propeller), Johanna Smith, Daisy. New propeller: Oregon.

MOORE SHIPBUILDING COMPANY

Oakland

Drydocking, cleaning, painting, miscellaneous repairs: Eastern Importer (hull), Grays Harbor, West Henshaw, West Keene (engine), Fernwood (engine and hull), W. P. Barge No. 2, Amy Turner (hull), A. H. Payson, Tamalpais, Saginaw (no repairs), George U. Hind, Philippine, Northland (no cleaning, painting), Meauticuit. Miscellaneous engine and hull repairs: Tuche, Golden Gate. Engine repairs: Sonoma, Steel Age, Bali, Royal Arrow, Pomona, Willfaro, S. C. T. Dodd, West Notus, Eastern Mariner, Santa Alicia, Bakersfield, R. J. Hanna, Steel Mariner. Hull repairs: Enaley City, Julia Luckenbach, San Francisco. Miscellaneous repairs: West Kedron.

NAVY YARD, PUGET SOUND

Drydocking, cleaning, painting bottom, miscellaneous alterations and repairs: Destroyers Tingey, Morris, Meade, Bailey, Thornton; Tug Sotoyomo, fuel ship Neptune. Drydocking, cleaning bottom: Cargo lighters Nos. 46, 88, 89. Miscellaneous repairs and alterations: Destroyers Gillis, Welles, Delphy, Swasey. Miscellaneous repairs: Fuel ship Orion; radio repair ship Saturn. Gunboat Vicksburg, West Canon, Coast Guard Bothwell. Repairs necessary for operation as district craft: Eagle No. 57, Pawtucket, Tatnuck, Iroquois, Mahopae.

SOUTHWESTERN SHIPBUILDING COMPANY

East San Pedro

Repairs electric machinery: Annie Hanify. Repairs boilers and engine: Fairhaven, Eastern Guide. Repairs main feed pumps: Julia Luckenbach.

TODD DRY DOCKS, INC.

Seattle

Extensive hull repairs: West Hartland. General overhaul: Burnside. New stem, cleaning, painting, caulking: Gleaner. New stern frame, planking, caulking: H. B. Lovejoy. Survey, hull and miscel-

laneous engine repairs: Santa Alicia. Cleaning, painting: Jitney; Levi W. Ostrander (also new shoe and hull repairs); Barges 41, 10, 14; Samson; Potlatch; Milwaukee. Change propellers: Catherine D. Voyage repairs, drawing tailshaft: West Ivis. White fuel oil burning apparatus, spare parts: Apus, Texan, Sylvan Arrow. Miscellaneous repairs: Forest King, Westerly. Boiler repairs: Washington. Miscellaneous engine repairs: Admiral Watson. Miscellaneous machinery repairs: Colin H. Livingston.

THE WINSLOW MARINE RAILWAY & SHIPBUILDING CO., INC., SEATTLE

Docking, painting, miscellaneous repairs: Henry Willard (also new mast). Docking, cleaning, painting, general repairs: Aurora (also overhauling iron work, renewing shoe); Spokane (also installing new mast); Watson A. West; Vancouver; Jim Butler (also engine repairs); Monitor. Caulking deck and topsides, renewing planking, work on engine thrusts and shafting, miscellaneous engine and general repairs: Santa Flavia.

YARROWS LIMITED

Victoria, B. C.

Cleaning, painting, repairs: Scow No. 17, Ruby, Madge, El Lobo, Princess Victoria. Cleaning, painting: Derrick scow Truant. Repairs: Restless. Survey: H. M. C. S. Patriot. Alterations to steering gear, engine room repairs: Prince George. Reconditioning work: Prince Rupert (completed and returned to owners).

Sperry in the Orient

T. A. Morgan, general sales manager of the Sperry Gyroscope Company, and Elmer A. Sperry, Jr., sailed in June for Japan and China. One of the primary objects of the voyage is to sign a contract for the installation of Sperry gyroscopic stabilizers on two ferryboats of the Imperial Japanese railways plying between Shimonoseki and Fusan across the straits. The vessels will be of about 4000 tons displacement.

While in San Francisco, prior to sailing for Japan, Messrs. Morgan and Sperry conferred with George E. Butler, Sperry agents, regarding the inauguration of service stations and service facilities for Pacific vessels equipped with the gyroscopic compass. When the navies of the world began to make the Sperry

compass standard equipment, the company established a world-wide service organization, which is now being extended to cover the merchant marine. Important installations have been made on vessels of the Cunard Line, and recently the Canadian Pacific, after testing the device on the Atlantic, has decided to install it on other vessels. These companies state that the Sperry gyro compass renders a great service because of the fact that it is a true compass without variation and deviation and also has no lag; in other words, it has none of the faults of the magnetic compass.

The Sperry Company is doing considerable work now on the high intensity searchlight, which is being made in sizes and weights that will accommodate any ship from the smallest yacht to the largest battleship. The high intensity light is one of Mr. Sperry's important inventions. At the present time the Sperry Company, under the guidance of Elmer Sperry, is making several important developments, one of which is the compound Diesel engine. Two of them have been made and are now running in the factory, and one has been running for about two years. This engine is a radical step in Diesel development, inasmuch as its weight per horsepower is about one-seventh of the ordinary Diesel and its fuel consumption is considerably lower.

"I have been with Mr. Sperry for about ten years," said Mr. Morgan. "I first came in contact with him when he had his first gyro compass installed in the United States Navy. I was so fascinated by this marvelous invention that I immediately set about to make plans to associate myself with him. Since then I have seen the Sperry Gyroscope Company grow from an organization of about a half-dozen men to its present size and have also seen the Sperry apparatus distributed throughout the world. Elmer Sperry, Jr., who is accompanying me on this trip, is a mechanical and electrical engineer and has been working directly under his father for the past five years, acting more or less as Mr. Sperry's representative in his most important engineering developments."

Personals

H. W. Poett, of Williams, Dimoud & Company, has been appointed chairman of the maritime and harbor committee of the San Francisco Chamber of Commerce. Other members are: George C. Boardman, Philip S. Teller, Leonard C. Hau-

mond, E. A. Christenson, A. W. Follansbee, Jr., Captain J. H. Bennett, C. E. Hume, J. C. Rohlfes, Captain A. F. Anderson, Charles R. McCormick, Arthur L. Black, Thomas A. Graham.

Ross L. Fryer, Albee building.

Washington, D. C., has been appointed District of Columbia agent of the Hooven, Owens, Rentschler Company.

S. L. Kreider has been elected president of the World Traders of Los Angeles.

C. R. Sheridan has been appointed Portland agent of the Atlantic, Gulf & Pacific, succeeding O. W. Chilton.

D. C. King, orange sales agent of the California Fruit Growers' Exchange, sailed for Europe in June to study foreign markets and to determine the possibility of selling larger quantities of citrus fruits abroad. He will visit London, Liverpool, Rotterdam, Antwerp, Glasgow, Paris and other cities. The new refrigerator vessels of the Royal Mail Steam Packet and Holland-America, which will be in service before the next season, will offer much better facilities for the all-water transportation of citrus fruits.

Captain Robert Dollar was re-elected president of the Pacific American Steamship Association at the annual meeting in San Francisco June 6. The other officers also were re-elected as follows: A. F. Haines, first vice-president; Daulton Mann, second vice-president; J. P. Williams, secretary-treasurer; Captain C. W. Saunders, J. C. Rohlfis and H. R. Struthers, directors.

Captain John T. Kinley has been appointed commander of the British steamship Nile of the China Mail. Captain E. L. Tindall has been made first officer.

William Fogarty, who has been in the employ of the Peterson Launch & Tugboat Company, San Francisco, for three years, has been made manager of the San Pedro Launch & Tugboat Company, which was recently organized by the Peterson interests.

Captain H. G. Morse has been appointed wharf superintendent of the San Francisco & Portland Steamship Company at Portland.

Captain Randall Rogers has been appointed commander of the Los Angeles Steamship Company's liner Harvard, which has been reconditioned for the Los Angeles-San Francisco passenger service.

David W. Niven has been made manager of the marine sales of the General Electric Company. In his new position, Mr. Niven will direct sales to the Federal government for naval and other purposes. Mr. Niven has been with the General Electric Company for twenty-one years and in the marine department since 1910. He is a native of Scotland and before coming to the



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David Sarnoff, the 30-year-old general manager of the Radio Corporation of America, whose appointment was announced recently.

United States was identified with Siemens Brothers in London.

Richard R. Florian, of Moore, Florian & Company, has been elected president of the newly-organized World Traders of San Diego. Other officers are: F. J. Lea, vice-president; Rufus Choate, vice-president of the Union National Bank, treasurer; W. L. Heathcote, agent for S. L. Kreider, who represents the T. K. K. and Williams Lines, secretary.

R. C. Morton, general agent of the Pacific Mail in the Philippines, will arrive in San Francisco on his vacation soon.

C. P. Converse, in charge of the foreign trade bureau of the Pacific Mail, represented the company at the Foreign Trade Convention in Cleveland.

Charles F. Stern, California state superintendent of banks, who resigned effective June 20, has been elected vice-president of the First National Bank of Los Angeles and of the Los Angeles Trust & Savings Bank.

Miss Mary Waterhouse, daughter of Frank Waterhouse, was married to James Charles Kerr of Seattle in June.

J. J. Tynan, manager of the Union Works, Bethlehem Shipbuilding Corporation, and his family were passengers on the 535 Silver State from New York to San Francisco.

Marshall Dill, of Dill-Crosett, Inc., has been appointed chairman of the foreign trade committee of the San

Francisco Chamber of Commerce. Other members are: Charles Branstetter, V. H. Pinckney, C. B. Lastreto, Daulton Mann, George C. Boardman, Jesse McCargar, F. F. G. Harper, T. S. Edwards, W. R. Edmondson, James McDonough, M. S. Roesti, J. H. Vinter, Frank E. Booth, A. C. Oppenheimer, C. E. Hume, A. A. Asher, W. J. Mitchell, Harry Glen-sor, Charles Saiz.

Captain Clyde Parker, former master of the steamships Rose City and Harvard, has been appointed San Francisco bar pilot, succeeding the late Captain George Korts.

Parker F. Wood has resigned as sales manager of the San Francisco branch of Fairbanks, Morse & Company to operate boats on the San Joaquin and Sacramento rivers.

A. C. Dierlex, assistant general manager of the Matson Navigation Company and president of the Honolulu Consolidated Oil Company, represented the latter company at an oil-lands hearing before Secretary of the Interior Fall in Washington in June.

A. M. McDougall of the McDougall-Duluth Shipbuilding Company and Dr. Henry Moskowitz of the Submarine Boat Corporation are members of a committee in charge of a convention of the Great-Lakes-Hudson and Atlantic Waterways Association to be held at the Lafayette Hotel, Buffalo, June 29 and 30, when the first united effort to develop the Barge Canal as a connecting link between the Great Lakes and the Atlantic Ocean will be launched. Among the exhibits will be a combination lake and canal barge of 1750 tons and other boats.

John D. Hashhagen, former traffic manager of the American Glue Company for several years, has been appointed traffic manager of the North Atlantic & Western, succeeding the late J. Karcher.

H. S. Eaton has succeeded Laurence O'Connell as assistant to M. F. Cropley, Pacific Steamship Company manager at San Francisco. Mr. O'Connell has joined the San Francisco office of Johnson & Higgins.

Ramon C. Cevallos has been appointed general agent of the Pacific Mail Steamship Company on the West Coast of Mexico with headquarters at Mazatlan.

John C. Ogden, formerly general manager of Thorndyke-Trenholme Company of California, has purchased the outstanding stock of the corporation and will continue the business of chartering and acting as steamship agent under the name of the John C. Ogden Company. Of-

fices will continue to be at 214 Front street, San Francisco.

G. C. Thayer, former general manager of the Harriman yard of the Merchant Shipbuilding Corporation, has been appointed assistant to the vice-president to handle special assignments, together with co-ordinating the sales activities of the same company's Chester yard. L. D. Keller, who for years was connected with the company's Philadelphia office as office manager, has been appointed executive assistant to the vice-president, his duties being that of an administrative assistant.

W. L. Bunker will be general manager of the West New York plant of the Lord Drydock Corporation, which was opened recently. Other officials stationed at the yard will be: John T. Watson, treasurer; T. F. Sullivan, general superintendent; J. E. Dorward, shop superintendent; Victor Watson, hull superintendent; D. L. Richardson, purchasing agent.

E. C. Genereaux, marine surveyor of San Francisco, has removed from 280 Battery street to 310 California.

Deaths

C. H. Clapp, former secretary of the Inter-Island Steam Navigation Company of Honolulu, in Fallmouth, Massachusetts, May 19.

Rear Admiral A. F. Fechteler, commandant of the Fifth Naval District, at Norfolk Navy Yard May 26.

Captain N. Rosich, master of the schooner H. D. Bendixsen, in Oakland, California, May 31.

Maurice Connell, a survivor of the Greeley Arctic expedition, in San Jose, California, June 3.

F. B. Oliver, ship broker of San Francisco, in Oakland June 10.

Captain A. Rasmussen, master of the U. S. A. T. Dix, at sea between Seattle and San Francisco, May 26.

Los Angeles Bond Issue

The people of Los Angeles have approved a bond issue of \$4,500,000, the proceeds of which will be expended on various work in and about Los Angeles harbor. An important item in the purchases will be cargo-handling equipment for the port. No list of what will be required has been made up, however, and nothing can be bought until the bonds have been sold.

Steamer Stacks

The Cunard Line, in describing the new liner *Scythia*, which will be placed in the trans-Atlantic service this summer, comments upon the vessel's one funnel and reviews the increase in the number of stacks of Cunard liners as follows:

Heretofore distinction in steamers

has been indicated by the number of funnels carried. When the paddle-wheeler *Scotia* entered the service in 1862 her two funnels won instant popularity for her. When the double-stacked *Aurania* carried the Cunard flag across the Atlantic in 1882 she dwarfed the value of the single-funneled *Russia*, which was, from 1867 until the *Aurania's* coming, one of the company's favorite ships.

Other steamers that won wide fame among travelers with their huge twin funnels were the *Umbria*, *Etruria*, *Campania* and *Lucania*, covering the years from 1884 well into the new century. The general public took a lively interest in the incoming and outgoing of these truly beautiful ships. They were considered triumphs of the science of ship building and were built on graceful lines. Consequently people flocked to the Battery or to points of vantage in Bay Ridge or Staten Island to see them pass.

In 1905 the *Caronia* and *Carmania*, each of 20,000 tons, sailed into the forefront of popularity with their huge size and great double funnels, the mark still indicative of supremacy, although a few three-stackers, such as the *City of Rome*, *City of*

Paris and *City of New York*, slipped in and won a throng of admirers for their trio of smoke exits and their yacht-like appearance. The New York is still in service, but one funnel has been removed.

Ships with four funnels appeared in 1907. These were the renowned *Lusitania* and *Mauretania*, 31,000-ton steamers, and for the time world wonders. Later years brought many more four-stackers and some massive three-stackers, and thus we established the popularity of the ship with many funnels.

Not only did the better class of passengers take to the steamer with the most stacks, but the emigrant wanted to cross in such a ship, too. When he bought his ticket he saw pictures of the great ocean liners on the walls in the steamship ticket offices and nothing but four-stackers would do for him. Usually coming from inland parts, he saw security in bigness and extra funnels, and so dummy stacks were added to some ships. Incidentally the Cunard Line never built any ships on this design. And he had to have big ships, although all practice points to the complete comfort enjoyed on ships of from 12,000 to 20,000 tons.



C. V. Lane, who has joined Ford & Geirrine, Merchants Exchange, San Francisco. Mr. Lane was chief engineering draftsman of the Union Iron Works Company for several years and was with the Bethlehem Shipbuilding Corporation, Union Works, San Francisco, an assistant chief engineer. He will assist in the handling of engineering problems as well as the general sales of Ford & Geirrine.

PACIFIC MACHINERY

A Floating Machine Shop

WITH the slowing down of construction in shipyards many of the established firms are turning their attention more particularly to repair and reconditioning work, and in this connection are extending and altering their plants in such a way as to enable them to more efficiently handle repair jobs.

In several former issues of Pacific Marine Review we have briefly noted the building and equipping of floating repair shops by various yards, and we are glad in this article to be able to give a full account of a very compact and efficient barge machine shop recently built and equipped by the Federal Shipbuilding Company.

The principal dimensions of this barge are: length over all, 68 feet; beam, 26 feet; depth molded, 7 feet. The hull and superstructure are of wood construction. The barge is not intended to be self-propelled but to be moved about by a small tug, and the superstructure house, as will be noted in the photographs, covers the entire hull.

It is in the equipping and power-



Interior view in the floating machine shop of the Federal Shipbuilding Company

ing of this shop that the greatest interest lies. The power plant consists of two semi-Diesel engines supplied by the Chicago Pneumatic Tool Company. One of these engines is directly connected, the Diesel piston and compressor piston being mount-

ed on the same rod to an air compressor cylinder having a capacity of 300 cubic feet of air per minute. This compressor supplies power for operating air tools for working torches, etc. The other semi-Diesel engine, also of the horizontal type, is directly connected to an 80 kilowatt direct current generator which supplies electric power for working all of the tools in the machine shop and also for operating four 3 kilowatt motor generator electric welding sets and for lighting the barge and shop. A small air compressor is supplied as a standby for furnishing power for starting up the Diesel engines when cold.

The machine shop is fitted with a 14-inch by 8-foot engine lathe supplied by the Monarch Machine Tool Company of Sidney, Ohio; with a 21-inch drill press from the Cincinnati Bickford Tool Company; with one 16-inch Cincinnati shaper from the Smith and Mills Company, Cincinnati; one 6-inch pipe threader and cutter from the Merrell Manufacturing Company, Toledo, Ohio; one 2-inch Landis bolt cutter; one 6-inch cut-off saw from the Peerless Machine



The power plant of the floating machine shop of the Federal Shipbuilding Company showing the Chicago Pneumatic Tool Company "Little Giant" semi-Diesel engines, one direct connected to air compressor and the other to electric generator. At the right are the motor generating sets for supplying welding current.



Exterior view of the Federal Shipbuilding Company's floating machine shop at work on the steamship Steel Exporter

Company of Racine, Wisconsin; one 30-inch by 4-inch wet grinder; one 12-inch double emery grinder from the U. S. Electric Tool Company of Cincinnati, Ohio; one forge from the Champion Blower and Forge Company of Lancaster, Pennsylvania.

The hold of the barge is used for steel storage tanks as follows: three fuel oil tanks of 1000-gallon capacity; one fresh water tank of 1000-gallon capacity; one lubricating oil tank for air compressor of 60-gallon capacity; two lubricating oil tanks for engine of 60-gallon capacity; one lubricating oil tank for machines, 60-gallon capacity; and one cutting oil tank, 60-gallon capacity. Suitable pumps are supplied for fuel oil service from the storage tanks to gravity tanks located over the engines and for fresh water service. There is also a bilge, fire and general service pump which has suction either from the bilges or from the sea and discharges either

overboard or to fire and sanitary systems. Pacific Coast shipbuilders will note with interest in the photo-

graphs the large wall radiators. A complete hot water heating plant is installed on this barge supplied by an American Radiator Company boiler.

The machine tools and pumps are all electrically driven with individual motors. The wire is all in conduit and under complete control from the main switchboard.

With this barge towed into position alongside a ship, power and machining operations are available for all such ordinary repairs as could be effected without drydocking the vessel, and its use has proven a matter of great satisfaction and economy to the repair department of the Federal Shipbuilding Company and has assisted that firm to offer its clients very much better dispatch in the handling of repair work.



Corner in the machine shop. Note radiator pipes and effective lighting from windows

A New Bolting-Up Machine

FOR a considerable period the Pneumatic Plate Tightener, Inc., of Seattle, has been perfecting the Hallett Invincible bolting-up machine, and at length has attained a machine that is producing remarkable results.

The new type of machine has several new features; one being that it is controlled entirely through an automatic valve placed in the handle; another being an air pressure chuck for gripping the bolts. This chuck deserves special mention, as it is operated by the same control as controls the air intake into the cylinders of the machine. The head of the bolt entering this chuck is immediately gripped, on the slightest turn of the air-controlled handle, by the jaws with a 400-pound pres-

sure, and upon the air being released from the machine, the handle also releases the air from the chuck, so that the machine is ready to leave the bolt automatically without any further control or effort on the part of the operator. This new feature is not only a material aid in the speeding up of the operation, but also enables the operator more efficiently to control and operate the machine.

Pull of Eleven Tons

This pneumatic plate tightener as now placed on the market has a two-cylinder air-pressure device with a draw-bar operating by combined toggles through pressure exerted by the cylinders. The pull on the draw-bar against the bolt is duplicated by the pressure of the stand against the

plate so that when the air is supplied to the machine and it starts to pull on the bolt, it not only pulls the bolt but presses on the plate and relieves the operator from the entire weight of the machine.

At university tests against the standard draw-bar pull, it has been found that the small machine, weighing 34 pounds with 90 pounds of air pressure, will exert a pull of 11 tons on the bolts, thus making it the strongest pulling machine for its weight that has ever been invented.

This machine is practically fool-proof and any ordinary workman or bolter-up can readily learn to operate it, and it cannot break in any way so as to injure the operator, making it efficient from a safety standpoint.

THE PNEUMERCATOR SYSTEM ON THE U. S. S. CALIFORNIA

By GARDNER CORNETT,
President, Pneumercator Company, Inc., New York



Figure 1—A typical Pneumercator group with its annunciator as mounted on U. S. S. California.

THE following is a brief description of an important installation of Pneumercator tank gauges on the United States battleship California, now under construction at the United States Navy Yard, Mare Island, California. This is a duplicate of the installation on the battleship Tennessee, built at the New York Navy Yard.

Practically all the large oil-burning vessels in the Navy have been equipped with the Pneumercator system for measuring fuel oil.

On board the United States battleship California, all of the fuel oil storage tanks, service tanks, drainage water tanks and steering engine lubricating oil tank, a total of 116 tanks, are equipped with E. T. I. type Pneumercator tank gauges. These instruments are shown in Figure 11.

Each instrument is equipped with both tonnage and foot and inch scales and gives an accurate indication of the tonnage in tank regardless of the specific gravity of the oil, the tank temperatures or the temperature of the instrument location.

A balance chamber is installed in the tank near the bottom from which a 7-ounce lead pipe is led through an oil-tight connection in the tank top to the operating cock of the gauge, the static head pressure of the liquid in the tank causing the gauge to function, means being provided at the gauge for establishing the true balance between the liquid head in the tank and the mercury in the gauge. Operating air for this purpose is supplied from a low-pressure compressed air line running fore and aft on both sides of the deck.

The storage tanks are under thirteen pounds' blowing pressure when in service and an additional tube line is led from the tank top to the top of the gauge, thereby cancelling the effect of the blowing pressure on the gauge itself. This makes it possible to get an accurate indication of the tonnage or depth of oil in each particular tank, regardless of the tank pressure.

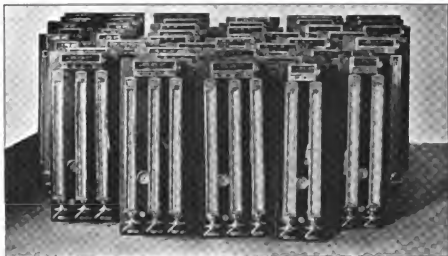


Figure 11-116 Pneumercator tank gauges for installation on U. S. S. California

Each gauge is also arranged to give both a visible and audible alarm when the tanks are 95 per cent full. This alarm operates on the ship's X circuit, which is the 20-volt call bell or signal circuit. The electrical contacts for this alarm are made at the gauge and not in the tank, and are so arranged as to exclude the possibility of an electrical spark anywhere in the vicinity of the tank.

The fuel oil service tanks each have two gauges: one located in the forward engine room and the other in the aft pump room.

The gauges are all mounted in

groups on ebony asbestos boards, as shown in Figure 1, with the annunciator for each group mounted on the same board.

The Pneumercator Company's interests locally are looked after by Mr. James C. H. Ferruson, agent, Monadnock Building, San Francisco, and both he and his engineering assistants, Mr. E. S. Ayres and Mr. A. F. Kuehne, have been quite active and been kept busy with installations at the various shipyards in California, as well as at the navy yards.

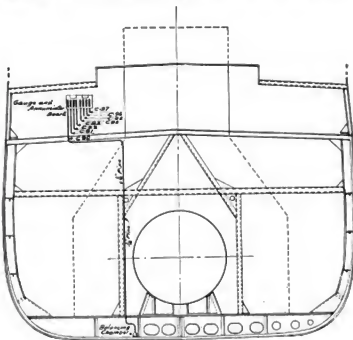


Figure 111—Diagrammatic sketch indicating the general method of connecting Pneumercator gauges to ships' tanks

NEW UNIVERSAL TILTING AND ROTARY TABLE



The Pawling & Harnischfeger new universal tilting and rotary table

Automatic Ship Lighting Sets

THE problem of auxiliary lighting aboard ship has been the subject of much discussion during the past few years. The present methods require either storage batteries, which deteriorate in time, or donkey boilers, which frequently are inconvenient because of the long time required to get up steam for power to generate the electricity. Not long ago Mr. C. B. Cooper of the Ship Owners' Radio Service, Inc., saw a demonstration of the Kohler Automatic, power and light apparatus, which was developed primarily for light and power use on the farm. Certainly it is a far cry from lighting stables on the farm to lighting different sections of a ship, but the Kohler device possesses several distinguishing features which serve

splendidly for use on the water.

By turning on any light or switch, the engine is automatically started and in less than four seconds it is operating to full capacity. It is a direct connected 110-volt D. C. generating unit with a capacity of 1500 watts—or, in other words, will take care of as many as 100 15-watt lamps commonly used aboard ships for auxiliary lighting purposes. Operating at full load the engine uses about 3.7 quarts of gasoline per hour. Through an automatic control, when the last switch or light on the circuit is turned off, the engine automatically stops.

It is readily seen how valuable this unit would be in any case of emergency aboard ship when in the middle of the night it would be neces-

AS a means of speeding up work and reducing machine shop costs, a new work table for use with floor type boring, drilling and milling machines, known as the Universal Tilting and Rotary Table, has been recently put on the market by the Pawling & Harnischfeger Company of Milwaukee. This accessory makes it possible to carry on machining operations on five sides of a piece and at any angle with but one set up. In the illustration the table is shown both in its normal and in one of its tilted positions. It has an elevation of 90 degrees and can be revolved a full 360 degrees at any position, whether flat or elevated.

Conveniently placed to enable the operator to accurately locate the work, there is a graduated dial. The table top is elevated by means of two coarse-pitch spur gear segments driven by worm and pinions, and is revolved independently by a bevel gear and pinion. One revolution of the ratchet handle revolves the table 30 degrees and one revolution of the elevating handle elevates the top $2\frac{1}{2}$ degrees. Adjustment along the bed plate parallel to spindle travel is accomplished by means of rack and pinion. The slots or table edges are used to locate work and the top is provided with trough to catch cutting compound.

A New Drill Chuck

THERE is being placed on the market by the Wayne Tool Manufacturing Co. of Waynesboro, Pennsylvania, a chuck for holding twist drills, which have been broken at the shank. The design is exceedingly simple, the chuck being composed of only six parts, viz: shank, casing, two pawls, two screws and a casing plate.

The drill is ground to a 60-degree point at the broken end. This allows the drill to automatically center itself, on a 60-degree recess in the shank, and on turning the casing the drill is locked in place by the two pawls gripping the drill about the grooves. No wrench is required to tighten or release the chuck.

With the tendency to reduce the expense of small tool equipment, this tool should readily find a place in shops where twist drills are used in large quantities on production work.



A new twist drill chuck manufactured by the Wayne Tool Manufacturing Company.

sary to have light, that merely to turn on the most convenient light or switch would automatically provide enough current within four seconds to give a light wherever a bulb was located; and then what a simple thing to turn off the power automatically with the turning off of the

last light when the last man had turned in.

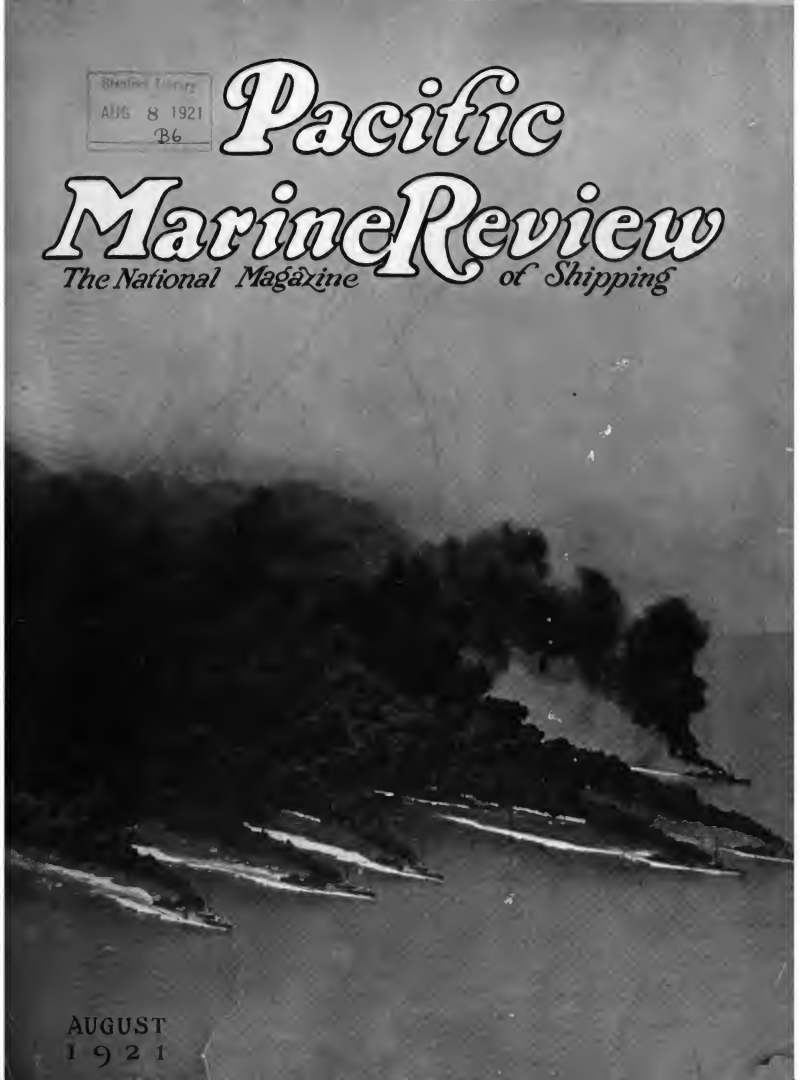
The Ship Owners' Radio Service organization has obtained the distributing rights for marine purposes, and through this organization the Kohler Company expects to maintain their marine service.

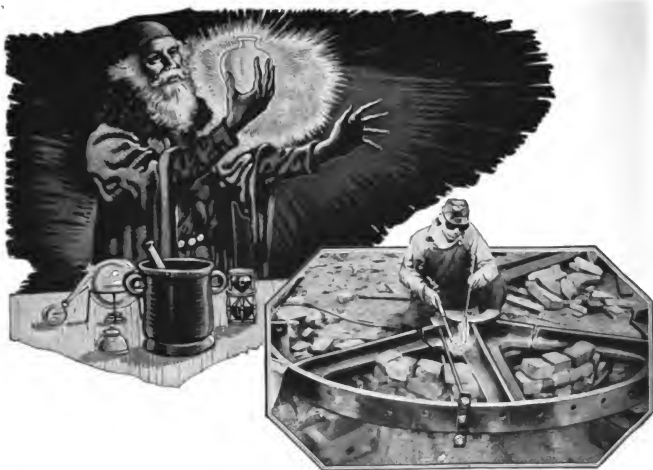
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Pacific Marine Review

The National Magazine of Shipping

AUGUST
1921





The age-old dream of the alchemist is realized because of Linde

THROUGH countless centuries man dreamed of transmuting the baser metals into gold. Patiently, laboriously, often consecrating their very lives to the work, the Alchemists of old toiled on toward their elusive goal.

As late as 1873 James Price, the last of the Alchemists, sought death by his own hand rather than acknowledge the failure of his experiments.

Linde Engineers of to-day have made this dream of by-gone ages come true.

By producing uniformly pure oxygen in industrial volume, they have made it possible for oxy-acetylene welders and cutters to reclaim thousands of tons of metal machinery annually—turning base metal into gold—a saving in money far in excess of any vision of wealth dreamed of by ancient philosophers.

And Linde does more than supply oxygen of absolutely uniform purity. Thanks to a chain of twenty-nine plants and forty-six warehouses it delivers Linde Oxygen when and where it is wanted in any volume.

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THE LARGEST PRODUCER OF OXYGEN IN THE WORLD



Pacific Marine Review

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CHALLENGE CUP RACE

IN the nineteenth race for the San Francisco challenge cup, the sloop *Machree*, defender, of the San Francisco Yacht Club, defeated the *Bob*, challenger, of the Corinthian Yacht Club, in San Francisco Bay July 10. The *Machree* was sailed by John R. Hanify and the *Bob* by Frank Stone. Corrected time gave the *Machree* the race by 5 minutes and 5 seconds.

The *Bob*, measuring 19.97 feet, was given 34 seconds over the defender, which measured 19.77, Class R measurements. Herbert Madden of Sausalito built the *Machree* in 1918; the *Bob* was built by Mr. Stone. The course was as follows: From starting line, leaving the stake boat leaving that buoy to port; thence to and around Goat Island shoal buoy leaving that buoy to port; thence to and around a stake boat anchored 2½ miles N. N. W. magnetic, leaving the stake boat to port (this stake boat is located as follows: With Point Blunt and Lime Point in range and Southampton Shoal light bearing N. W. by W. ¼ W. magnetic); thence to and around the Presidio shoal buoy, leaving Alcatraz Island to starboard and Presidio shoal buoy to port; thence to finish across starting line; leaving stake boat to port. The start was made at 1 o'clock; the *Machree* finished at 4:04:57 2/5, and the *Bob* at 4:10:36 2/5.

All the nineteen races for the San Francisco cup have been sailed in San Francisco Bay except that of 1914, which was in Humboldt Bay. The record of the races is as follows:

DATE	WINNER	LOSER	DATE	WINNER	LOSER
Aug. 31, 1895	El Sueno, Encinal Y. C.	Queen, S. F. Y. C.	Aug. 3, 1907	Discovery, C. Y. C.	Valkyrie, South Coast Y. C.
Aug. 15, 1896	Pawn, Encinal Y. C.	Catherine, S. F. Y. C.	May 23, 1908	Discovery, C. Y. C.	Neva, S. F. Y. C.
June 26, 1897	Aeolus, Corinthian Y. C.	Pawn, Encinal Y. C.	June 19, 1909	Presto, C. Y. C.	Mah Pe, South Coast Y. C.
Sept. 23, 1899	Gadder, S. F. Y. C.	Truant, C. Y. C.	May 21, 1910	Ruby, C. Y. C.	Merry Widow, Aeolian Y. C.
Aug. 4, 1900	Aeolus, C. Y. C.	Gadder, S. F. Y. C.	Aug. 19, 1911	Presto, C. Y. C.	Challenger, S. F. Y. C.
Aug. 10, 1901	Presto, C. Y. C.	Helen, Valjejo Y. C.	Sept. 3, 1912	Pleur de Lys, S. F. Y. C.	Moonlight, C. Y. C.
May 31, 1902	Challenger, S. F. Y. C.	Harpoon, C. Y. C.	May 25, 1913	Oreades, Sequoia Y. C.	Challenger, S. F. Y. C.
July 8, 1904	Corinthian, C. Y. C.	Challenger, S. F. Y. C.	May 1914	Ruby, S. F. Y. C.	Cecelia, Sequoia Y. C.
July 17, 1905	Corinthian, C. Y. C.	Challenger, S. F. Y. C.	Aug. 11, 1916	Active, S. F. Y. C.	Moonlight, Aeolian Y. C.
			July 10, 1921	<i>Machree</i> , S. F. Y. C.	<i>Bob</i> , C. Y. C.



The sloop *Machree* of the San Francisco Yacht Club, winner of the nineteenth race for the San Francisco challenge cup



Left to right—The start of the San Francisco challenge cup race, July 10, 1921. *Machree* sailed by John R. Hanify. The *Bob* sailed by Frank Stone

LIPTON CUP RACE

IN two races, the first of which was at Cowichan on July 2 and the second at Victoria July 4, the Seattle Yacht Club's Sir Tom defended her title to the Lipton challenge cup by defeating the Patricia of the Royal Vancouver Yacht Club twice. Carrying 1900 pounds more lead in her keel and twenty feet more canvas than the challenger, the Sir Tom never was headed from the starting line to the finish of the first race. She led at the end of the first leg by 30 seconds, but was almost overhauled by the Patricia; she overcame trouble with her spinnaker, however, and led at the finish by 2 minutes and 37 seconds.

Second Race Better

The second race was even better. The Patricia got away to a better start, which the Sir Tom overcame in part by taking the chance of fouling the Patricia in cutting across her bows. The Sir Tom soon after tacked to port. The Patricia, then on the starboard tack, tried to cross the Sir Tom's course, but failed and was forced to put about, after which both yachts squared away on the port tack only a few feet apart. On a starboard tack the Sir Tom caught a veering and fresher breeze and held a straight course for the buoy, while the Patricia fetched up to leeward and had to make a long tack.

The Isherwood race will be run between the Sir Tom and Patricia September 3-6 in English Bay, Vancouver. By the time next summer's Lipton race is held Victoria will have an R-class yacht. A \$5000 subscription is being raised.

About Ted Geary

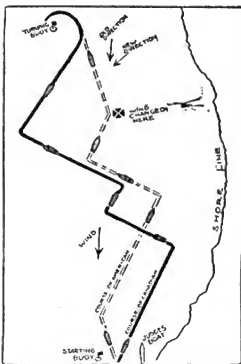
The Seattle Times publishes the following interesting sketch of Ted Geary, who sailed the Sir Tom:

Only once in his fourteen years of international yacht racing on the Pacific Coast—from the days of Spirit I down to Sir Tom—has Ted Geary, who learned the art of sailing in Elliott Bay, when he and the Johnson "Boys"—Dean and Lloyd—raced one another in canoes fitted with sails made of gunnysacks, known what it was to taste defeat.

This wonderful success of the young Seattle man, who has designed and sailed his own sloops in the International cup races, comes in for proper recognition now, in view of his latest triumph over the worthiest rival he ever met.

Out-Designed Two Greatest

In those fourteen years he has pitted his skill in seamanship against the best that British Columbia and California could produce, and, most marvelous of all, he has out-designed the two greatest English yacht designers who have lived during the past quarter century, namely, Fife and Nicholson.



Course of the Lipton cup race, July 4, 1921

It was Fife who designed Shamrock I and Shamrock II for Sir Thomas Lipton, and it was Nicholson who designed Shamrock IV, the last challenger Lipton brought out for the America cup.

Beat Fife and Nicholson

It was Fife who designed Alexandra, the sloop that Geary beat with his Spirit I at Seattle in 1907 after a series of three sensational races, the first two being by half-boat-lengths, the Seattle sloop winning the first that July day in 1907 and the Canadian winning by the same margin three days later, only to lose by a half mile in the deciding race.

It was Nicholson who specially designed the Patricia for the races in which she was defeated at Cowichan Bay and at Victoria a week ago—beaten by Geary's own-designed and personally-sailed Sir Tom.

When Ted Geary defeated Fife's Alexandra in 1907 he had just reached his majority.

Sir Thomas Arrives

In 1908, Spirit I was beaten for the Dunsuir cup by Alexandra. That convinced the young Seattle yachtsman that he had to build another sloop. He brought out Spirit II in 1909 and with it obtained his revenge, beating the Alexandra handily. Having beaten the Canadians with his second Spirit, he let them have it. They bought it in 1910.

Sir Thomas Lipton came along shortly afterwards and put up his fine \$2000 trophy. Geary built his Sir Tom forthwith and promptly took hold of the trophy by defeating the British Columbia boat, the Turenga, in 1914.

In 1915 the Sir Tom successfully defended the Lipton cup against the Myth of Everett. Then the Sir Tom was taken to San Francisco to race in the international regatta for sloops of her class. There, against not only her own but against other yachts, the great Seattle sloop won seven races—every one in which she started.

Meet Again in September

In 1916 Sir Tom successfully defended the Lipton cup again against the Defender, also of this city. In 1920 the Turenga got another beating from Sir Tom at Cowichan Bay and Victoria, and then, this year, came the Nicholson-designed Patricia—and, she got hers, too.

Incidentally, the Sir Tom and the Patricia are to meet again this year—and very shortly. They will race for the Isherwood cup, in English Bay, Vancouver, between September 3 and 6.

OUR COVER

This very remarkable marine photograph was taken upon the occasion of the recent maneuvers of the Pacific fleet off the southern California coast, and shows the torpedo boat destroyers going into action with their smoke screen flung out across the water.



The power cruiser Marlin

A MODERN FLYING DUTCHMAN

THE accompanying chart of the passage of the ship Edward Sewall around the Horn in 1914 is taken from the Fireman's Fund Record, which comments upon it as follows:

There is a basis of fact in the legend of The Flying Dutchman—the ghost ship that is eternally trying to round Cape Horn and forever being beaten back. The above chart shows why sailor folk gave the cape its bad name.

Follow the course on this chart day by day.

The course is that of the sailing ship Edward Sewall while trying to round Cape Horn in 1914.

It took her sixty-seven days to get from latitude 50 south on the east of the continent to the same parallel on the west side. On ten previous voyages the ship had made this portion of the voyage in from ten to twenty-three days, the average being 16.4 days. The illustration gives the course in detail between the 54 degree line. The coast line is indicated with no suggestion of the treacherous isles and inlets.

A glance at the dates showing the vessel's location day by day makes the story clear. On April 19, for instance, she was further east than on March 30, and

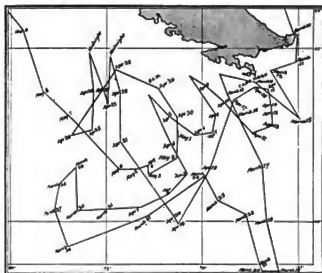


Chart showing the wanderings of the American sailing ship Edward Sewall rounding Cape Horn in 1914

so it went. Those bare lines are the skeleton of a sea romance—but the Sewall made it in the end.



Speed boat Pisces



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J. S. HINES
 B. N. DORCHE
 A. J. DICKIE
 ANDREW FARRELL

Publisher
 Business Manager
 Editor
 Associate Editor

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 M. B. STEWART, Manager

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THE SHIPPING BOARD

THE chairman of the Shipping Board is to be congratulated on his recently announced appointments of three vice-presidents for the Emergency Fleet Corporation to take charge of the division of operations of that organization. The tentative plan of Chairman Lasker for the division of responsibility between these three appointees was to place one in charge of allocations and charters, one in charge of traffic, and one in charge of physical operations, which includes repairs and maintenance.

For the first position Mr. Lasker has secured the services of J. B. Smull of New York, a partner in the freight brokerage firm of J. H. Winchester & Company, who has gained a reputation in the eastern metropolis as one of the most efficient men of his profession. It is currently reported that his income from his private business amounts to \$250,000 a year.

For the traffic department W. J. Love was chosen. Mr. Love has been for some years the freight traffic manager at New York of Furness, Withy & Company, a British firm which is close to the top among the great freight steamer operators and owners of the world. Mr. Love, an American citizen, thoroughly American in his outlook on life, is considered one of the ablest of the younger shipping executives, and should prove a very efficient director of the traffic department of the Emergency Fleet Corporation.

For the third vice-presidency in charge of physical operations, the chairman has chosen Mr. A. J. Frey of Los Angeles. Mr. Frey's reputation as a steamship operator is very well known on the Pacific Coast, where he was for many years connected with the old Pacific Mail Company and more recently has been operating the Los Angeles Steamship Company.

These three men should be able to give the operating division of the Emergency Fleet Corporation very efficient leadership. They have already begun to effect drastic changes in the personnel of the department and are pledged to change the fleet over as rapidly as possible to the bare-boat charter plan.

In making these appointments Mr. Lasker has made a good beginning in clearing out inefficiency in the operation of the Shipping Board, and these men undoubtedly will have the backing of the entire marine fraternity in their efforts to stop the leaks and pick up the loose ends and unravel the tangles which have been so characteristic of Shipping Board operation.

AT WASHINGTON

AT the same time that Albert Lasker, chairman of the Shipping Board, and his carefully chosen aids are endeavoring to straighten out Shipping Board tangles, Congress is apparently busily engaged in providing more difficulties. The administration has made a call upon the Shipping Board to get the government out of shipping; Congress has practically commanded the Shipping Board to turn the fleet over to private operation, has approved the idea of bare-boat charter; and yet at the present time there are up in the House before various committees bills which would add to the operating responsibilities of the Shipping Board and would perpetuate commercial operation under the government.

A bill is at present before the House Committee on Merchant Marine and Fisheries which would concentrate all army transport and the Panama Railroad steamship operations under the Shipping Board, and at the same time the Secretary of the Interior has slipped into his Alaska bill a section providing that the Shipping Board be directed to transfer to the Secretary of the Interior ships suitable for establishing a commercial steamship line under the jurisdiction of the Department of the Interior from the mainland of the United States to points in Alaska.

This section in the latter bill will have to be carefully watched and, if possible, nipped in the bud, especially as there is nothing in the title of the bill to indicate its existence. The full title is as follows: A bill to provide for the consolidation or redistribution of the powers and duties of the several executive departments of the government of the United States relating to the territory of Alaska and for other purposes.

There is no doubt that if Alaska be allowed to develop normally under her tremendous resources, there will be ample business for not one but several privately operated lines and ample opportunity for the growth and prosperity of the Alaskan population which, under the present system, is either stationary or constantly diminishing.

THE MARINE ENGINEERS

THE National Marine Engineers' Beneficial Association has capitulated to the Shipping Board and signed with that body an agreement covering six months. This agreement calls for a very substantial reduction in wages and for drastic changes in working rules. William S. Brown, president of the M. E. B. A., in the July issue of the American Marine Engineer, official organ of the Marine Engineers' Beneficial Association, prints a very elaborate statement covering twenty-seven pages and setting forth the inside history of the strike from the standpoint of the marine engineers.

This statement should be read carefully by all ma-

rine engineers and by all ship operators. In it President Brown proves the fallacy of the doctrine of collective bargaining, and in it is shown very plainly, so that he who runs may read, the danger to union labor and to industrial America from the cheap politicians who are exploiting union labor for their own benefit.

The Marine Engineers' Beneficial Association is composed of men who should be highly trained executives. The position of chief engineer on a modern ocean freighter requires mental capacity of no mean order. It would, therefore, be expected that in such a union the principle of collective bargaining would be successful, if success could be found for such a principle in the dealings between employer and employee, but we find in the report of William S. Brown that the local districts of this organization, although obligated by very strong pledges to follow the lead of their national representatives, in many cases not only refused to follow that lead, but during the negotiations hampered in every way the efforts of their national representatives to arrive at any agreement, going so far as to falsify the reports and to use prop-

aganda directed solely for the purpose of furthering their own local ambitions.

Any fair-minded man reading this report would say that the resolution of the American Steamship Owners' Association refusing to have any dealings with the National Marine Engineers' Beneficial Association was wisely taken and should be strictly upheld.

There are probably many engineers among the ranks of the Beneficial Association who will learn a valuable lesson from the failure of this strike. Indeed, we would venture to predict that the ranks of this association will be very much thinner in the near future than they have been during the "fat years" of America's merchant marine just left behind. Many of the younger men from all ranks of civilian life who seized the opportunity to get big wages easily when it was easy to get papers will now be forgetting all about marine engineering and going back to the trades and professions from which they came. That will be good, both for the American merchant marine and for the Marine Engineers' Association.

AN OPTIMISTIC SHIPBUILDER

JOSEPH J. TYNAN, general manager of the Union plant of the Bethlehem Shipbuilding Corporation, which includes the Alameda works, the Potrero works and Hunters Point drydock, has just returned from the East, where he has been engaged in a series of important conferences with the officials of the Bethlehem Corporation and has completed a tour of industrial centers, so he has had a very exceptional opportunity to judge of the present condition in American business and industrial affairs.

In an interview with Mr. J. S. Hines, publisher of Pacific Marine Review, Mr. Tynan takes an emphatically optimistic position in direct contrast with that taken by the majority of American shipbuilders. He states that in his opinion there is far more need for constructive optimism at the present time than for much of the sadly pessimistic views that we have been having, and he is fairly well satisfied that there is going to be an improvement along the main lines of industry—an improvement that will be almost immediate in its inception and very wide in its scope. In other words, he thinks that we are now standing on the bottom and looking upward, and that our industrial affairs on the Pacific Coast, especially in the San Francisco Bay region, are infinitely better than they were in 1906.

Mr. Tynan had the following remarks to make, particularly about the Bethlehem interests and their local plants:

"Speaking for the Bethlehem interests, I can say very emphatically that we are not downhearted. The report that we are planning to shut down our Alameda yard is without warrant. We have no intention of closing either the Alameda or the Potrero works. If we can't get ships to build, we'll build something else. We are going to operate both works. We are on the eve of a great industrial revival—the greatest, I believe, that the world has ever seen. And the Bethlehem organization is going to be on its feet and moving when the new day dawns.

We have secured the rights to build the best Diesel engine in the world. We are not only going to build the engines here, but we are going to build everything that goes with them—ships, auxiliary machinery and everything. Our experts will be back shortly from Eu-

rope, where they have been making an intensive study of the new engine and every detail of its production.

I have just returned from a trip through the East, and would like to tell those who complain of local conditions that we in San Francisco don't know what hard times are. I saw shipyards in the East whose entire force consists of two men—a day watchman and a night watchman.

We are not going to come to that here. Speaking for Bethlehem, we have an organization of mechanical experts capable of functioning in many manufacturing lines besides shipbuilding and industries related to it. It took a lot of time and money to get that organization together. Our plans on both sides of the bay represent a tremendous investment in the highest type of equipment. We are going to hold our organization and make that equipment pay for its keep. We are too busy getting ready for the busy days ahead to be downhearted. San Francisco has more to be grateful for than any city in the world."

What Mr. Tynan has to say about the future activities in general lines of engineering on the part of the local plants of the Bethlehem Shipbuilding Corporation is of great interest. The Potrero works, or the Union Iron Works, as it has always been known locally, have built up a great connection in the general engineering field and in mining engineering which will undoubtedly stand them in very good stead in the absence of new ship construction. The plants at Hunters Point and at the Union Iron Works are also very well fitted out and adapted for marine repair work of all sorts, and undoubtedly they will handle many large reconditioning jobs which will increase in number and size as the world's shipping gets back to a more normal basis.

Pacific Coast owners and operators will be greatly interested in watching the building of Diesel engines by this firm, as without doubt there will soon be a large demand for the conversion of many of our steamers into motorships, and with two plants like the Alameda works and the Potrero works of the Bethlehem Shipbuilding Corporation, fitted and in readiness to turn out standardized Diesel engine propulsion units to take the place of the reciprocating engine, there will undoubtedly soon be a sizable fleet of steel motorships on the Pacific Coast.

THE LARGEST SUGAR REFINERY IN THE WORLD

An Interesting Account of a Great California Enterprise

ALL sugars are carbohydrates. There are many varieties, the most important among which are the groups classed under the names of sucrose and glucose. Sucrose contains 12 atoms of carbon, 22 of hydrogen, and 11 of oxygen. Cane and beet sugars belong to the sucrose group. The most common variety of the glucose group is dextrose, which is found in raisins, small grains, and occurs quite frequently in small fruits. It has less sweetness than sucrose and possesses the property of preventing the crystallization of sucrose when combined with it in small amounts, and hence is used in the preparation of soft fillings for cream candy.

Sucrose, derived from various vegetable sources, is a solid in a crystalline form with a specific gravity of 1.6 and a melting point of about 320 degrees Fahrenheit. It is soluble in about half of its weight of cold water and in almost any portion of boiling water. It is practically insoluble in such fluids as alcohol, turpentine, ether and chloroform. The principal sources of sucrose are sugar cane and sugar beet. In the account of the California and Hawaiian Sugar Refining Corporation sugar cane alone need be considered.

Sugar Cane

Sugar cane (*saccharum officinarum*) is a giant perennial grass which grows from 8 to 24 feet in height. The stem of the cane is solid with joints every 3 to 6 inches and ranges in diameter from 1 to 2½ inches. The pith of the cane contains the sugar juice, and the tops with their leaves are not crushed but are used for seed bed purposes, as the plant is produced from the eyes or buds which grow on stems around the joints. The roots of the cane throw up canes or ratoons for many seasons. In Hawaii the growers do not count on ratoons for more than a few crops, but in Cuba the process is repeated for many years.

Ripe cane usually consists of about 12 per cent fibre and 88 per cent juice, this percentage varying from time to time, both as regards quality and quantity.

Cane Growing

In Hawaii cane is usually planted from March to September, and the cane ripens about one year from the following December. Growing cane requires water every seven days, the amount of water used being tremendous. A plantation producing 35,000 tons of

This article is compiled from the subject matter of an address on the subject, "Something About Sugar Refining," which was delivered before the San Francisco Section of the American Society of Mechanical Engineers at their May meeting by Mr. George M. Rolph, general manager of the California and Hawaiian Sugar Refining Corporation. The address was so interesting and comprehensive that many of the engineers expressed a desire to inspect the plant of the corporation at Crockett, which is located on San Francisco Bay about one hour and a half ride by train and boat from San Francisco.

There have been incorporated in the article some observations taken from a booklet prepared by the California & Hawaiian Sugar Refining Corporation as a souvenir for the mechanical engineers on the occasion of their visit.

Readers of Pacific Marine Review will be particularly interested in the arrangements for handling the sugar cargoes at Crockett, and it is with that idea in view that this summary stresses the material handling devices installed there. A more detailed account of these devices will be found in a separate article. Necessarily this article, covering such a large subject, gives a very sketchy outline, and we shall in future issues elaborate in greater detail certain features of this "World's Greatest Sugar Refinery."

proximately 35 per cent water and 65 per cent solid. This syrup is then boiled in a vacuum pan and reduced to crystals, which are separated from the liquid by means of centrifugal machines. These crystals are packed into sacks holding about 125 pounds each, and the sugar is now ready to be shipped to the refinery at Crockett.

The raw sugar thus produced would contain practically 96 per cent of sucrose, and there would be little or nothing gained in carrying the process of manufacture beyond this point, as the final extraction of all impurities and the production of pure white granulated sugar is the work of the refinery.

The cargoes of sugar collected from various ports in the Hawaiian Islands and received at Crockett range from 5000 to 12,000 tons. The daily capacity of the refinery is 2000 tons. The plantations produce sugar over a period of about eight months. The re-

raw sugar a year requires twice as much water per day as the city of San Francisco. In December and January cane flowers indicate maturity and readiness for cutting. As the ripening goes on tests are made with a polariscope to determine the amount of sucrose in the juice. Upon the indication of these tests cutting is begun and usually continues until well into July and August.

Raw Sugar

Operations necessary for making raw cane sugar from sugar cane are as follows: Extraction of the juice, purification of the juice, evaporation to syrup point, concentration and crystallization, separation of the crystals from molasses.

The cane is fed by mechanical contrivances into two large rolls with interlocking corrugated teeth, the juice being squeezed out into a metal trough through which it runs into a large tank. This juice contains much dirt and other impurities. It is pumped to the top floor of the mill where a solution of milk of lime is added to neutralize acidity, the mixture is heated, and the hot juice run into large settling tanks, from which after a time the clear juice is drawn off. This clear juice then goes through filters, being strained through fibre excelsior, and is run thence to the receiving tanks or evaporators. It is now light brown in color but thin and watery and must be reduced to syrup consistency. It is next boiled in a multiple evaporator and reduced to a point where it contains ap-

finery operates for a period of eleven months. These two facts make necessary very large warehousing facilities, as during the fall months it is necessary to store at the same time three months' supply of raw sugars and at least thirty days' production of refined, which would mean a total of approximately 150,000 tons.

Handling at Dock

At Crockett there is ample depth at all stages of the tide for the heaviest draft ships to dock alongside the warehouse. The warehouse was designed especially for the expeditious unloading of sugar from the ship. Many schemes have been tried out for the handling of the sugar from the ship to the dock by means of conveyors, but so far they have been unable to compete with the sling and cargo boom arrangement using the ship's cargo winches.

This fact should not discourage the designers and manufacturers of cargo handling machinery for docks and warehouses, as the Matson Navigation Company's ships, which are used in the carriage of this sugar, were designed and arranged especially with the idea of a quick discharge of sugar at this particular terminal, and the terminal itself, on the other hand, was designed particularly with these ships in mind, while the warehouse and refinery are equipped with one of the most complete systems of conveying machinery to be found anywhere.

The new dock and its warehouse are arranged so that there are double landing stages, and the conveyor system has a very large part in the quick dispatch in that they get the slingloads and truckloads of sugar out of the way faster than they can be landed on the dock by the slings and by the gangs of stevedores using trucks out of the side ports of the ship.

As the sugar is landed on the dock it is sorted as to brand, weighed in the presence of representatives of the refinery and the producers, and out of each truckload as it passes the scales a sample is taken so that the producer may be credited with the proper quality. Inside of the warehouse the sugar is handled entirely

on conveyors. These are arranged so that any part of the warehouse may be easily reached, both by incoming or outgoing sugar, and the sugar may be piled readily to any height within the capacity of the warehouse.

A raw sugar storage bin with a capacity of 1500 tons is installed in the refinery adjacent to the warehouse, making it possible to send a large proportion of each cargo from the ship direct into the refinery without storage in warehouse, thereby eliminating much unnecessary handling.

The main belt conveyor system running from the dock side of the warehouse to the refinery is a very large installation of its kind. This 7-ply canvas and rubber belt is 36 inches wide and 1600 feet long. There are two belts of these dimensions, both of which are used when the plant is operating at full capacity. The belt has a capacity of 40 sacks of sugar per minute. These belts are run in a continuous straight line arrangement returning over large pulleys. The lower side carries the raw sugar from the dock or warehouse to the head of the raw sugar bin, while the refined sugar comes back to the warehouse on the return of the same belt. Smaller lateral belt conveyors deliver the raw sugar from the warehouse onto this belt at convenient points, and other conveyors are arranged to switch off the refined sugar from the main belt to its point of destination in the warehouse.

At the time of the visit of the mechanical engineers the Matson liner *Manoa* was at the dock discharging a 6500-ton cargo of raw sugar. All of the belt conveying system was working in perfect order, and the sugar was being handled out of the ship with great dispatch and with no confusion or straining of effort on the part of anyone.

A few days previously the largest cargo of raw sugar ever delivered to this refinery had been brought in on the *Manulani* of the Matson Line. This cargo consisted of 10,234 tons of raw sugar and was discharged at the rate of 2325 tons per day of eight

(Continued on page 490)



The plant of the California and Hawaiian Sugar Refining Corporation at Crockett. The largest sugar refinery in the world.

THE MOORE SHIPBUILDING COMPANY

By FRANK L. MULGREW

OUT of the greatest shipbuilding program ever completed in an American shipyard the Moore Shipbuilding Company has emerged as the largest repairing plant on the Pacific Coast. A vision of the future, born in the midst of record-making accomplishment, has proved the wisdom of its conception by giving to the Oakland plant a permanency at a time when the shipyards of other centers are being closed and dismantled. With the close of the story of war-time work, of the unusual demand for bottoms, of expansion and achievement, there has opened another that is written with all of the initiative, foresight and energy of the first. Oakland and San Francisco bay are to remain the center of shipbuilding and ship repairing activities of the Pacific, for here are all the facilities, ready at hand and busily engaged in making fit the carriers of the western ocean.

With the launching on Saturday, July 9, of the 10,000-ton tanker Birkenhead for the Vacuum Oil Company, New York, a shipbuilding program that eclipsed that of any other shipyard in the country closed at the Moore Shipbuilding Company. Since 1916 sixty-two hulls (totaling 563,755 deadweight tons) have been launched, forty-eight for the Shipping Board and fourteen for private companies. Of the government vessels thirteen were tankers, eight refrigerator ships and twenty-seven freighters. The privately owned vessels include tankers for the Vacuum Oil Company, Standard Oil Company and Southern Pacific Company, and freighters for the Matson Navigation Company. They ranged from the 9400-ton freighter which Robert S. Moore designed and made the standard to the great 16,340-ton Tamiahua, built for the Southern Pacific to sail on Atlantic waters.

Time and again the shipbuilding accomplishments of the Moore Shipbuilding Company brought to Oakland and the Pacific Coast the attention of the world. Scarcely a week passed in those days when every effort was being strained to furnish the needed carriers for war duty without the shattering of record and tradition.

At the beginning of the war the Moore Shipbuilding Company had just begun the construction of new vessels. It was already a shipbuilding plant, and had there been no war would have built a number of vessels for the government and for private owners. Once the world trouble started the entire energies of the company were focused to turning out the vessels which played so large a part, not only in shortening the conflict, but in the victory. The call came for a "bridge of ships" and every man in the plant responded.

When this call came the Moore plant was small and without organization for so stupendous a program. Yet



Robert S. Moore

the authorities at Washington, D. C., had confidence in the concern and placed with it contracts for many millions of dollars in vessels. The manner in which this confidence was justified is shown in the record of achievement. The plant expanded and developed, organized armies of workers, added building ways, shops and foundries and brought in more steel than industrial Oakland had ever seen. There came the time when 13,000 men were employed and when the weekly payroll was \$275,000. The one ship grew to ten building ways. New methods were devised, clockwork organization was put into effect and the work of the great shipyard co-ordinated in a manner that made it a pattern for both coasts. The genius at work in all this was Robert S. Moore, the same man who made the plant a shipyard in the days before the war and who could

see, even in the midst of an epoch-making construction period, the need to make ready with drydocks and marine railways for the labors that were to come with peace.

Double launchings, which have become ordinary, were unknown a few years ago, and it was the Moore Shipbuilding Company that showed the way. The story had scarcely ceased echoing in marine circles when the company launched three 9400-ton tankers on the same tide and the word again traveled to all of the ports of the world. Before any other company had succeeded in duplicating the feat the Moore shipyard had repeated the triple launching and arrangements were made for a feat so much beyond anything hitherto accomplished that it became an important news feature with all of the press associations, brought out the motion picture camera men and was featured in marine journals as a brilliant upsetting of precedent. This was the sextuple launching on Saturday, December 20, 1919, when three 9400-ton freighters and three 10,000-ton tankers—a total of 58,200 deadweight tons—took the water on one tide in fifty-five minutes. The memory of that occasion will live long with the thousands who saw it. Six launchings without a hitch and the problems of a narrow estuary and of clearing the stream for the succeeding hulls cared for in masterly fashion!

While all of this shipbuilding history was being made, and while a task of gigantic proportions was under way, Robert S. Moore saw beyond the circle of a tremendous present and planned for the future. He began to prepare for the ship repairing that would come with the close of hostilities, and, at his suggestion, the company expended \$8,000,000 in new docks and facilities. Today no other concern on either coast is better equipped for building, repairing or overhauling vessels.

THE CLEOPATRA'S BARGE

By J. M. LYDGATE

THIS is the time and this is the place to recall the story of the famous private yacht called *Cleopatra's Barge*; the time, because it was just a hundred years ago that she was the wonder of the world, and the place because it was on Kauai that she terminated her eventful career.

The Crowninshields were a sturdy and enterprising family of Salem merchants, doing a large business with India and China—away back 150 years or so ago—and out of this business they accumulated very comfortable fortunes. Nevertheless, every boy of the family, whatever his ultimate destination, was given a nautical education and sent to sea to learn every branch of the far-reaching business. George Crowninshield, in whom we are particularly interested, went through this training like all the rest and was finally taken into the traditional firm together with his brother, Benjamin. After a few years this brother, Benjamin, retired from the firm to become secretary of the navy, and shortly after the father died.

A World Wanderer

Already possessed of a liberal fortune and unmarried, with no one dependent upon him, George determined to build a yacht and see the world in her. Salem was one of the leading seaports of New England in those days and had turned out a good many famous vessels, and one *Retire* Becket, or "Tyre" Becket, as he was known, was the crack builder of fast clippers. To him was intrusted the building of the *Cleopatra's Barge*, which should be the finest and fastest yacht that the world had known. She was started in the spring of 1816 and finished, ready for sailing, early in December of the same year. Even while she was on the stocks, the fame of her spread abroad and people came far and near to see her.

She was just about the same in dimensions as the famous yacht *Mayflower*—83 feet on the water line, 23 feet wide and 11½ feet deep; 191½ tons. She was what is called a hermaphrodite brig, that is, square-rigged on the foremast and fore-and-aft on the mainmast. She carried every kind of sail that you could put on a yacht, some of which have gone entirely out of use now.

But it was in her cabin fittings and appointments that she was the marvel of the age. The main cabin measured 19 by 20 feet and was panelled in mahogany inlaid with birdseye maple and other fancy woods. The furniture was mahogany, upholstered in red velvet, decorated with gold lace. There were two large sofas, with gilt bronze ornaments, a chandelier, a sideboard, two large mirrors, etc., and an elaborate and expensive service of silver and china, made expressly for her. The furniture of the cabin was valued at \$8000. The vessel herself cost \$50,000, which was a lot of money for those early days.

Completed in 1816

She was finally completed December 6, 1816, and after being shown to the family was opened to the public at large. On the opening day 1900 ladies and

The *Cleopatra's Barge*, or *Pride of Hawaii*, needs little introduction to students of old maritime records, but even they doubtless will find much that is new in this account, and those to whom the vessel is unknown have here an opportunity to become acquainted with her. This article was read by J. M. Lydgate of Lihue, Kauai, before a meeting of the Kauai Historical Society. Mr. Lydgate is one of the foremost authorities on early Hawaiian days.

700 men came aboard to inspect and admire her, and many useful and valuable gifts were added to her equipment; and as long as she remained in Salem, she was crowded with visitors. While she was being fitted up for her long voyage, the owned lived on board and received a great many people at dinner parties and other entertainments. He selected his cousin, Benjamin Crowninshield, as his captain, and his son, Benjamin, Jr., went as passenger and incidentally kept a very careful, illustrated journal of the voyage. The crew was of about the usual size for such a vessel,

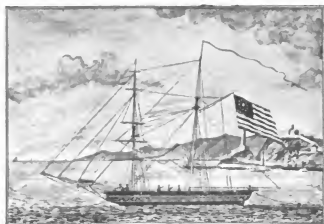
with rather better provision for the commissariat.

On March 30, 1817, she sailed for the Mediterranean, her departure being witnessed by a great concourse of people. The first port of call was the Azores, where she remained in the harbor of Fayal for a week and where she was visited by all the principal people, and hosts of them were entertained.

Calls at Madeira

From there to Madeira was a short voyage. At Madeira the yacht remained a week. During this time almost everyone on the island visited her and met with a cordial reception, for Crowninshield was a democrat to the core. Everyone was welcome who knew enough to behave. The consequence was, here and elsewhere, that so many people availed themselves of this liberty that it was almost impossible at times to carry out the daily routine of the ship, and the visits of these people became a great nuisance.

At some of the ports at which the vessel stopped later in the Mediterranean, the crowds were so great that it was found necessary to try to keep them back and at Barcelona the vessel had to be hauled out of the harbor into the outer road to prevent the pressure of these great crowds. It was in vain, however, for they followed the vessel in boats, and many of them becoming deathly sick, that was added to the other discomforts. It was at Barcelona, also, that many



The *Cleopatra's Barge* at Genoa
From catalog of the *Cleopatra's Barge* exhibition, Peabody
Museum, Salem, Mass.

people in the endeavor to get on board, were crowded overboard, and among them three ladies.

Leaving Madeira the Cleopatra's Barge sailed for the Mediterranean, where she visited the following places: Tangiers, Gibraltar, Malaga, Cartagena, Port Mahon in the island of Minorca, Barcelona, Marseilles, Toulon, Genoa, Leghorn, the island of Elba and Civita Vecchia.

Paint Never Dry

The owner was very particular about having everything kept "shipshape" and in appieple order. During the short space of two months, while she was in the Mediterranean, she was repainted no less than three times; in fact, the paint was hardly ever dry. At Marseilles an army of workmen came aboard, the gilt work was all regilded, additions were made to the cabin upholstery and one stateroom was dismantled and refurnished in a different style.

Before setting out on his voyage the owner had provided himself with 300 letters of introduction to the most eligible people at the different ports where he intended to call. And the presentation of these letters no doubt helped to augment the number of daily visitors.

Some idea of the interest that was taken in the vessel may be gathered from the fact that on an average 3500 people a day visited her while she was in port, and one day at Barcelona, by actual count, no less than 8000 people came aboard. Many dinner parties were given and entertainments were served every day in the saloon to her invited guests. In order the better to entertain these guests the generous host engaged a number of professional musicians and at Elba these were increased to a full band.

A Surprised Baron

At Genoa an interesting episode occurred that must not be overlooked. A certain baron, von Zach, a German astronomer of distinction, came aboard with all the rest of the world, and he gives an interesting account of his visit. In the course of the conversation, the name of Bowditch was mentioned—Bowditch was the standard authority on navigation aboard all American ships and was held in becoming respect even by the rest of the world.

"He is a friend of our family and our neighbor in Salem," replied the captain, "and that young man, whom you see there, my son, was his pupil; in fact it is he, and not myself, who navigates the ship. Try him and see how much he knows."

The German astronomer turned to the young man, saying: "What was your dead reckoning error in making the Straits of Gibraltar?"

"Six miles," was the answer.

"You must have got your longitude mighty close. How do you get it?"

"By chronometer and by lunar distances, both."

"What! Do you know how to work up the longitude by lunar distances?"

"Why, our cook can do that," replied the young man.

"Here, Jack," calling to the negro cook, "come and show this gentleman how you get the longitude!"

More Surprises

The cook came up with a dressed chicken in one hand and a butcher knife in the other; and the baron put him through a cross-examination in regard to working lunars that quite satisfied him that he knew perfectly what he was talking about. The captain told him to put down his chicken and get his books and journal and show the gentleman his work, which he did. And everything proved to be entirely in order,

according to the highest standards of the best navigation, which is more than can be said for most ordinary sea captains. This negro cook had been round the world as cabin boy with Captain Cook in his last voyage and was well acquainted with the particulars of his death at Kealakekua in 1779.

Crowninshield was an ardent admirer of Napoleon and made a point of going to Elba to see where he had been in exile, from which he had escaped only a couple of years before. Many of his friends were still there, whose acquaintances he made and who in turn gave him letters of introduction to the Bonaparte family in Rome. So from Elba they went to Rome, where they remained a couple of weeks, largely as guests of the Bonapartes. These Bonapartes were more or less under supervision for fear they might attempt to rescue their great leader in exile at St. Helena and the attention paid to them by the wealthy owner of this fast yacht, that could outlast anything afloat, was regarded by the French authorities with suspicion. So they set a French man-of-war on her track, to keep watch of her, but the Cleopatra soon left her far in the rear.

The Owner Dies

Crowninshield had hoped to extend his voyage to the Eastern Mediterranean, the Greek islands and even Constantinople, but the lateness of the season warned him that he must give up this plan and return to America, which he did, arriving in Salem on the 3rd of October, 1817. He at once began to plan another voyage for the coming year. But "man proposes and God disposes;" within two months he was dead.

In settling his estate the Cleopatra's Barge was sold at auction the following summer for \$15,000, her cabin furniture and fittings being reserved. She made one or two voyages to South America in the merchant service and was finally sold to Kamehameha, king of the Hawaiian Islands. In pursuance of this sale agreement, she departed from Salem June 18, 1820, and arrived in Lahaina, November 6 of the same year.

Trader for Sandalwood

On the 16th of November, 1820, Liholiho, or Kamehameha II, and his prime minister, Kalaimoku, purchased the Cleopatra's Barge from Captain Sutter for \$90,000 to be paid for in sandalwood by installments. Her name was then changed to Haaheo O Hawaii (The Pride of Hawaii).

During the next three years she led a somewhat checkered career as flag-ship of the incipient little Hawaiian navy, and the private yacht of the king and royal family. As there was at this early time no regular means of transportation between the islands, the Haaheo O Hawaii came in for all kinds of varied service, from royal dispatches to the outer islands to return loads of taro and pigs. She was so vast an improvement on the unseaworthy and unsavory craft that they had been used to that they regarded her as a paragon of beauty and comfort, and every ali'i (chief or noble) who could possibly manage it sought for the favor of an inter-island trip aboard of her.

A Treacherous King

One of these trips deserves special mention. On one occasion King Liholiho, either from a drunken whim, or to carry out a crafty design, sailed for Ewa in an open sailboat, and then when he once got to sea compelled his attendants to continue the voyage to Waimea, Kauai. Arriving there the next day he threw himself, entirely helpless, into the power of King Kaumuali'i. That noble chieftain, instead of taking

any advantage of Liholiho's defenseless condition, gave him a hospitable reception and sent his own brig to Honolulu to make known the king's safety and to carry his commands. In two days the five wives of Liholiho arrived on board the Cleopatra's Barge. The two kings then spent several weeks in a tour of the island of Kauai, and Kaumuali'i spared no pains or expense to give his royal guest the best kind of a time that he could devise, which in this case was mainly plenty of drink.

And what return did Liholiho make for this generous hospitality? On their return to Waimea the king invited Kuamuali'i to spend a few hours aboard his flag-ship, the Haaheo O Hawaii, and while the unsuspecting prince was seated in the cabin, orders were secretly given to make sail, and he was torn from his kingdom, to remain henceforth a virtual prisoner of state in Honolulu.

In the best of circumstances these old Hawaiian chiefs were surrounded by a scurvy lot of beachcombers and reprobates. Naturally a weak and dissolute prince like Liholiho gathered this kind about him almost exclusively, and it is a matter of no great surprise that the Pride of Hawaii was manned by a drunken, dissipated, irresponsible crew from the captain down to the cabin boy. Nor is it a matter of any surprise that she should come to an untimely end.

This happened about the end of April, 1824, at Hanalei, where she was stranded on the Monolau reef just off the mouth of the Wailoi River.

The early missionary, Rev. Hiram Bingham, came to Waimea on a visit about this time and finding the chiefs and many of their effective followers had gone to Hanalei in response to the call for help to save the stranded vessel, he followed them thither, taking three days for the trip.

On his arrival he found a large concourse of people busily engaged, under the leadership of the chiefs, in efforts to salvage the vessel. They collected from the woods and margins of the river nearby large quantities of hau bark, from which they made several thousand yards of strong rope. This they stranded together into three large twelve-fold cables. These three cables were then attached to the mainmast of the brig, a few feet above the deck, and then strung out inland in three parallel lines. The plan was by means of these cables to roll her bodily over the reef

into the quiet water within, where she could be repaired, and then floated out through the channel.

Every available man was gathered up and distributed on the cable and when everything was ready, Kiaimakani, the luna nui (director) for the occasion, passed up and down the lines enjoining silence—*nūke-hamau i kalee*. Then the official chanter man took up the chanter song and everyone stood ready for action till the chorus "*huke!*" (heave away), came and the three great lines of surging power strained the great cables so that the juice fairly ran out of them. The brig felt their power; rolled up slowly until her side struck the solid wall of the reef; then she stopped; but the lines of men went on—something had to give. The mainmast broke short off and fell over the quiet water within the reef.

These well-considered plans to save the vessel being fruitless and she being now in worse condition than before, they became discouraged and gave up the attempt, leaving her there. And there she remained until gradually the pounding surge of the trade-wind seas broke her up.

Mr. A. S. Wilcox, whom I interviewed a few years ago relative to wreckage from the Cleopatra's Barge, gave his recollections substantially as follows:

When I was a boy, somewhere along in the '50's, I remember very distinctly the efforts of A. S. Nuuanu, a Hawaiian of a good deal of energy and executive ability, to recover materials from the wreck of the Cleopatra. He had a scow anchored out in front of Waipa, off the present Waipa bridge, and by means of divers he got up two iron cannon and some wooden wreckage, perhaps part of a capstan.

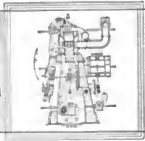
I remember my brother Edward made a ruler out of a piece of the wood. The two cannon were about Hanalei for many years and indeed until comparatively within recent times. Sometime ago I inquired about them and was told by Mrs. Deverill that they had been carried off by an English man-of-war. Since I have built at Hanalei I have wanted to get hold of them to set up in my yard, and failing the recovery of these, I reverted to the brass cannon, said to be imbedded in the bottom of the sea, where the Cleopatra was wrecked. Native fishermen report having seen such a cannon in a hole in the reef. I made an arrangement with Kahaleike to locate this cannon with a view to raising it, but thus far, we haven't found it.



Crowninshield's Wharf, Salem, during the embargo of 1806, showing sailing ships tied up for lack of freight
From illustration in "The Marine Room, Peabody Museum at Salem"



Oil Engines and Motorships



MOTORSHIP ERA

Some Observations of an American Marine Engineer on Board a Swedish Ocean-Going Motorship

By R. Z. DICKIE

ONE of the most noticeable facts in shipping circles today is that, while many steamers are laid up because they cannot afford to carry freight at the present rates, practically all of the motorships are continuing in operation and apparently making profits for their owners. At the same time all of the motorships on the stocks are being rushed toward completion and many are being contracted for by the wisest heads in the shipping game in Europe. Having observed this fact, the writer, when it became necessary for him to make a trip to Europe, decided to take passage on a Swedish motorship in order that he might observe at first hand the methods employed on board these ships and the operation at sea of their Diesel engines. He accordingly secured accommodations on the motorship Pacific of the Johnson Line routed from San Francisco through the Panama Canal to Dublin, Ireland.

No attempt will be made in this short article to give a log of the voyage or any of the actual tests, but merely to set down a few observations from the practical operating engineer's viewpoint.

Reliable Operation

The first fact which impressed itself strongly upon the observer was the continuous and entirely reliable operation of the Diesel engines, with apparently even less attention required than had been the writer's experience in connection with reciprocating steam engines.

Another feature was the excellent shop facilities provided for any repairs which might become necessary while the ship was under operation. According to the engineers on this ship, their owners have found it rather difficult to have Diesel engine repairs effected at

many overseas ports. In every case the work at shore rates had been extremely expensive and very often badly done. They have, therefore, considered it rather a profitable investment in their more modern ships to install an elaborate machine shop in connection with the engine room, space being easily available for this feature on account of the absence of steam pipes, condensers and auxiliary pumps in the engine room of a motorship. Usually in these shops there will be found a moderate sized lathe, an excellent drill press, a grinding machine, and a shaper, all driven by belting from a small electric motor.

The Pacific carried four wipers, of whom two were competent machinists. As the engines are automatically oiled by forced feed, these wipers have little to do and spend most of their time making minor repairs, making and grinding valves and making adjustments on the engines as required. The chief engineer spoke with pride of the bills for shop repairs. In a period of nearly seven months these were less than \$700.

As to the reliability of operation, the chief engineer's log shows that the Pacific had operated thirty days continuously on California oil (asphalt base) and fifty-two days continuously on Texas oil (paraffine base), these runs being terminated simply because the vessel had reached its destination.

In using low grades of oil for fuel the valves sometimes become clogged up with carbon and it becomes necessary to change them. This change can be carried out without stopping the engine, simply by cutting out the cylinder which is to have its valve changed. While this operation is somewhat dangerous, it has often been done at sea in cases

of necessity. An efficient engine room crew can put in a new valve in about fifteen minutes where there is necessity for haste.

Engine Room Ventilation

On the working platform of the engine room of the Pacific the temperature averaged about 105 degrees Fahrenheit, but on the top platform it ran as high as 135 degrees Fahrenheit, and this station, particularly in the tropics, became quite uncomfortable. It seemed to the writer that adequate ventilation should be provided at this point, and it would be well for American designers of motorships to thoroughly investigate this feature. Ventilation at the top of the engine room could probably be best accomplished by electric fans arranged to keep air in the engine room within a few degrees of the outside temperature. Such forced ventilation could be divided into several units so that only the necessary number of fans, according to the outside temperature, need be kept in operation. The writer was glad to see, through reading an article recently in Pacific Marine Review, that in the engine room of the American motorship Kennecott the ventilation has apparently been well taken care of.

Propeller Slip

One very interesting feature to the writer in the operation of this ship was the decided slowing down under head winds, indicating great propeller slip. The twin screws of the Pacific are four-bladed, 10 feet in diameter and 8 feet 2 inches pitch, with about 40 per cent surface, and at full power of the engines will turn 134 revolutions per minute, each engine indicating at that rate 1950 i.h.p. With good weather, no head winds, the slip on these propellers would be about 7 per cent. Under some conditions of the weather

found on this trip the writer figured that the propeller slip actually reached a figure as high as 34 per cent. With a large, heavily pitched, slow turning propeller, there would of course be no such variation. In motorships this condition can very readily be attained either through reduction gearing, as on the Libby Maine, through electric gearing, as is now being installed in several yachts, or with the perfection of the design of marine Diesel engines it may even be attained on a practical basis with direct connection. In fact, trials have just been had on a single screw motorship built by

Doxford and Son at Sunderland, England, powered with a 3000 h.p. direct connected opposed piston, crude oil engine running at 77 r.p.m. full load speed.

Proposed Installations

In connection with the repairing of Diesel engines at sea, it will be remembered by the readers of Pacific Marine Review that in February, 1921, the writer published an article describing a Diesel electric drive in which power was generated by a number of small units. This idea was suggested to the writer by Mr. Milton L. Towne, who also suggested that together with this instal-

lation there be fitted a fully equipped machine shop with a small overhead electric crane which could deliver all parts of the various units from the engine room to the machine shop, and that there be added to the crew three Diesel machinists who would effect all of the necessary repairs and adjustments independently of the operating engineers. Since the trip on the Pacific just described the writer is more firmly convinced than ever that some such scheme of installation will characterize the motorships of the future.



Motorship Yngaren, built at the Pallion Works, Sunderland, by William Doxford & Sons, Ltd., and engined with their new opposed-piston marine oil engine. The Yngaren is here shown at her dock trial in the Tyne in front of the Pallion Works

EUROPEAN MOTOR SHIPBUILDING

Exclusive Correspondence Pacific Marine Review

POSSIBLY the writer may be accused of exaggeration when he says that Germany is making a bold bid to become the leading motor shipbuilding country in the world but he has strong grounds for believing this to be the case. It is extremely difficult to obtain definite information regarding the mercantile shipbuilding programme which is now being carried out in Germany but the following facts are sufficient to indicate that very great activity is being shown in the construction of internal combustion engined ships.

German Activity

In addition to the two 14,000 tonners fitted with geared Diesel machinery which Blohm and Voss are building for the Hamburg America Line, orders have been placed by the same owners for

eight standard motor ships of 6,000 tons d.w.c. Two 3,000 ton tank vessels have just been launched for the Stinnes combine in which Krupp's engines will be fitted. The Hansa Line has placed an order with the Weser Shipbuilding works for a 10,000 tonner to be fitted with machinery of 3200 i.h.p. of the four cycle type whilst the Hamburg South America Line has contracted with Howaldtswerke of Kiel for a 12,000 ton ship in which two 3000 b.h.p. Sulzer Diesel engines will be installed. At the new Deutsche Werft of Hamburg, standard motor ships are being built equipped with A.E.G. Diesel engines which incidentally are being manufactured in the fine workshops which were originally designed for the construction of large steam turbines. This policy of motor ship construction

should not be ignored by American shipowners, and in England very careful note is being taken of German progress, although as previously mentioned, the Germans are giving away as little information as possible.

In the meantime it is significant to learn that the very greatest difficulty is being experienced in disposing of surrendered German ships to British shipowners even at the remarkably low prices at which they are offered. It is reported that motor ships are being built in Germany at a cost of 2,500 marks (at present exchange rate about \$37.50) per ton deadweight, which is very much lower than either a steamer or motor ship can be built in any other country in the world.

The First Doxford Motorship
The long-awaited trials of the

first Doxford engined motorship have at last taken place and have excited the widest interest among both shipowners and shipbuilders. The vessel in the Yngaren and is one of three ordered by the Transatlantic Steamship Company of Gothenburg, who are now pinning their faith entirely to internal combustion engined ships. The Doxford engine is probably now so well known it is not necessary to give a full description of the new design. It may be recalled that it is of the opposed piston two-cycle type developing 3,000 i.h.p. in four cylinders 580 m.m. bore each piston having a stroke of 1160 m.m. It has as many departures from existing Diesel engine practice as it is possible to embody in a motor of this design, since air blast injection is abandoned, the compression pressure is reduced from 500 pounds to 300 pounds per square inch, and the speed has been brought down to the very low figure of 77 r.p.m. The fuel is injected into the cylinders from a pump driven off the crankshaft operating at a pressure of 9,000 pounds per square inch, while there is an electrically driven auxiliary pump for use in the event of trouble arising with the main pump.

The control gear is of the simplest possible design and for moving the camshaft when reversing no compressed air is used, the whole operation being carried out by hand, an interesting novelty in connection with an engine of such high power. The motor is controlled by one wheel which is turned to the left for astern and the right for ahead operation, complete control being effected by a movement of the same handwheel which reverses the engine. As an example of flexibility, the Doxford design is superior to all others since the motor can be run continuously at well under 20 r.p.m. and indeed far below the minimum speed required for driving the ship during manoeuvring.

The Yngaren is a standard ship and carries about 9,500 to 10,000 tons d.w. at a speed of some 10½ knots on a daily fuel consumption of 10 tons. At the trials a very representative gathering of shipowners and engineers from various parts of Europe were present and the technical innovations in the propelling machinery were the subject of the most lively interest. The ship is about 420 feet in length and in external appearance is noteworthy as being one of the very few motor vessels built in the United Kingdom in which no funnel is provided. This is due to the wishes of the

shipowners, who like most Scandinavians prefer the funnelless ship to one in which the ordinary steam ship funnel is provided.

The auxiliary machinery of the Yngaren also has its element of novelty. Like most British shipbuilders Doxfords had a leaning to steam plant, but the owners considering steam totally out of date required the electrical drive. Doxfords have therefore constructed a type of auxiliary engine which they are now standardizing, operating on the opposed piston principle. There are three units installed each developing 100 b.h.p. in two cylinders of no more than 7 inches diameter. In these small engines also the solid injection fuel system is adopted and low compression employed, this being effected in the case of the main motors by fitting a solid uncooled portion of ingot steel on the top of the pistons. This remains at a high temperature during the whole of the cycle so that the temperature of the air after compression is not required to be so great as when the ordinary cooled piston is used.

Another ship of the Yngaren class for the same owners will be completed during the course of the current year and a third vessel will be placed in commission in 1922.

A New Bibby Motor Liner

Another motor ship which has just been completed in Great Britain is the Somersetshire and as she was constructed at Belfast where the joiners' strike is not effective it has been possible to finish her off completely. All other ships built in England or Scotland have to go abroad for completion or wait until

the joiners' strike is over. This applies also to the Yngaren which after trials was sent to Gothenburg for final joiners' work to be carried out. The completion of a number of large motor ships has been held up on the Clyde on account of this very prolonged strike.

The Somersetshire which was constructed by Harland and Wolff for the Bibby Line is practically identical in hull dimensions and engine power to the large United States Shipping Board motorship William Penn, the completion of which has recently drawn attention in Europe to the possibilities of extended development of motorship construction in America. The Somersetshire carries 12,000 tons of cargo and about a dozen passengers, being about 450 feet in length over all. The machinery equipment like that of the William Penn comprises two 2250 i.h.p. Burmeister and Wain type engines manufactured by Harland and Wolff. It is worth noting that the cylinders of these engines with the dimensions of 740 m.m. bore and 1150 m.m. stroke are now standardized throughout the world for Burmeister and Wain are building six and eight cylinder engines with this standard cylinder and Harland and Wolff are adopting the same policy. Moreover, William Cramp and Sons are manufacturing engines with the same horsepower so that it may be said an advanced degree of international standardization has been effected. The full influence of this will be felt when there are enormous numbers of motor vessels on the sea fitted with machinery of similar types for it will be possible for a limited number of spare parts to



Ore-carrying motorship Strasse, first of sixteen similar vessels on order

be kept at various ports suitable for the machinery of many different ships.

The Somersetshire which was designed for trade to the East is a sister vessel to a motorship owned by the Bibby Line which on her maiden voyage averaged a fuel consumption of only 12 tons daily, for a mean speed of between $11\frac{1}{2}$ and 12 knots. It is estimated that an oil fired steamer of the same size would require between 30 and 32 tons of fuel while a coal burning ship would need well over 50 tons. As the price of oil in England has recently been brought down to £4.10.0 per ton while Welsh coal costs £3 per ton (and needless to say is difficult to obtain on account of the coal strike) the economy of such a motorship does not need much emphasis.

Motor Shipbuilding Active

It is a proof of the popularity of the motorship among European motorship owners that while the construction of steamers for the most part is being delayed, work on motorships is allowed to progress and in addition to the vessels already mentioned, about half a dozen motorships have been launched or completed during the past month. From Vickers' Works at Barrow the first of four tankers for Tankers, Ltd., named the Scottish Standard was launched while the Seminole, a motorship for the Anglo American Oil Company, of the same size was completed and sailed on her maiden voyage. On the Tyne, Armstrongs launched their first motorship, a 6,000-tonner to be equipped with Sulzer machinery of about 2,500 h.p. on twin screws. This latter vessel is more than usually noteworthy on account of the fact that she will be the first large British built ship to be equipped with Sulzer engines.

The Tosi Engine

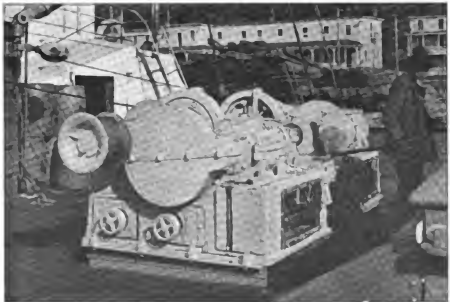
Although a great deal has been heard of the Tosi engine and Diesel motors of this type were, during the war, largely used on submarines, comparatively little progress has been made in the construction of the Tosi motor for mercantile vessels. The first two ships equipped with such engines have just been completed in Italy and the three Beardmore engined cargo boats built on the Clyde are now well under way, the Beardmore engine being practically the same as the Tosi type. The two ships referred to are the Primula and Ardito. In the latter a couple of 1200 h.p. six cylinder motors are installed, the largest of the type that have yet



Alaska Steamship Company's motorship Kennecott just returned from a round trip to New York, on which she gave a very good account of herself, both in fuel economy and reliability

been built. The Tosi firm whose works are at Legnano, Italy, have recently patented several new devices in connection with their Diesel engines with the object of preventing the many troubles to which Diesel engines are liable. Quite the most interesting feature is in connection with valve design. The engines are of the four cycle design and in the cylinder cover are the usual air starting and fuel valves but the air inlet and exhaust valves are combined in one. This valve leads to two separate pipes, one being the exhaust and the other open to the atmosphere through which

the atmospheric air is drawn in on the suction stroke. Between the valve and the two pipes is a semi rotary valve which closes one and opens the other pipe alternately according as the engine is exhausting or is inspiring the air. There are two advantages claimed for this arrangement. In the first place one valve is eliminated, thus rendering cylinder cover design more effective and secondly, the exhaust valve should last much longer without needing to be cleaned owing to the fact that the combination valve is continually cooled by the air passing over it on the suction stroke.



Two of the electric deck winches of the motorship Kennecott

RIDICULOUS ENGINEERING

Some Ludicrous Mistakes of Marine Engineers

By SEA FLAME

THE serious side of marine engineering is generally considered. Seldom is any humorous angle presented. There are times, however, when extremely ludicrous incidents crop up. Some of these are attributable to ignorance. Others might be classed as plain foolishness. The writer believes that an anecdote or two on the funny side of engineering might make a smile, and at the same time act as a deterrent to those who do not use their "think-tanks."

A Lively Coffee Urn

On a Lake built ship, of which the writer was chief engineer, several things were found which struck the comical note. Most noticeable was the way the former chief had piped up the coffee urn in the saloon pantry. From correspondence and bills, it appeared that this urn was purchased at a coast city, to be installed by the ship's force. When the writer joined the vessel he was told by the Steward that the urn would not operate, and that letters were in his room regarding it. An inspection showed that the urn had been piped up with the live steam leading to the valve that was supposed to be piped to the fresh water supply, so that both water jacket or coffee receptacle could be filled. As the boiler steam was let into this, the result can easily be imagined. Cover blew off of urn, and pantry filled with live steam. But the rest of the piping was about the same. The inlet end of the steam coil in bottom of urn was piped up to the pantry scupper, and the outlet end was open.

Just what ideas the poor chief had who did the job, the writer does not know. The copies of the letter both to and from the suppliers of the urn, showed that the latter were more than astounded that such an absolute ignorance should have been displayed by any engineer. The third assistant engineer who came with the writer to the job fixed it one morning while on watch, and then the troubles ended.

It might also be mentioned that the same vessel was fitted with two Engberg dynamos and engines. Neither of these would hold on the governors. It was found that both governors had been allowed to freeze.

In this article our friend Sea Flame points out some of the ridiculous blunders into which marine engineers are led by lack of experience and training. He also shows how ridiculous is the position taken by the marine engineers in the present argument between the Marine Engineers' Beneficial Association and the owners and operators of our merchant marine, and narrates his experience in engine room operation with an open shop American plan engine room staff.

A Tapped Condenser

Another time many years ago, when the writer was working as a machinist, he was ordered by the foreman to get over to a sternwheel boat and do a job that the chief wanted done. He found that the job was to put a hose nipple and valve at the bottom of the condenser. (The job was a compound, condensing one.) The chief had also purchased about fifty feet of 3/4-inch hose, with a shut-off nozzle. His idea was that by connecting up his hose to the condenser when the boat was running that he would get nice hot fresh water to wash down with. He very kindly explained to the writer what he was having done. As at the time obeying orders without comment was the rule, the job was done to the chief's idea. When the boat left for up Sound, and things were going well, Mr. Chief slugged her down well with strong caustic water around the wooden floors of the engine room, and after scrubbing it well with a broom, dragged the hose along and opened the valve to the condenser. The result can be imagined. The vacuum fell, and the engines slowed. Every place but the right one was looked to for the trouble, and as the job had an abnormally large L.P. cylinder in proportion to the highs, she would only go "dead slow" with a low vacuum. The captain of the boat, who also held an engineer's license, came down to see what was up, and found the trouble. Needless to say there was a new chief the next trip.

"A Cool Washroom"

The lack of knowledge and

thought among some members of the crew is also the cause of numerous funny incidents. One in particular happened on a Panama line boat. She had refrigeration rooms on the main deck, cooled by the brine system. One hot afternoon the return brine commenced to go up in temperature. The engineer on watch noted this, and increased the ammonia flow. Temperature still rising, he reported to chief, who went on a hunt for trouble. He found it. In one of the cold rooms was a saloon waiter with a couple of buckets of hot water, soap and dirty clothes, having a fine washing day. When growled at for his foolishness, seemed quite surprised, and explained with a deal of self-satisfaction, that he thought he should have been complimented in finding such a nice cool place to do his washing. After that the steward kept a lock on all the rooms.

Searchlight Regulation

Equally comical was the way a mate put on a searchlight to throw illumination onto the wharf while cargo was being worked. He desired a small light, and had the idea if he put the switch in "easy" he would get it. He did. It naturally blew all fuses when she began to arc. After a few trials, he gave it up, and the chief was again appealed to. Explanation followed, and the mate was told that the searchlight was not supposed to be used as a cargo light.

New Engine Accelerator

Again, when the engine room telegraphs first came in, the writer was engineer with a new boat so fitted. The captain had never been with a "telegraph" before, and when docking, would pull the transmitting handle around with a jerk, so quick that the hammer for the gong would not get time to drop. The whole apparatus below would surge and groan under the strain, and only a "grind" be heard as the pointer went around. After docking the chief attempted to explain to the captain that it would be better to pull the lever with a slower motion, as then the gong would ring, and the machine not be put to such a strain. The captain looked at the chief and asked, "Well, doesn't it make the engine go faster to pull it quick?" Sounds incredible, but it's true.

Trial Speed Exaggeration

A very common fault of steamship designers and builders is to exaggerate greatly the speed and carrying capacity of the several vessels turned out. As a matter of fact the percentage that comes up to the estimated tonnage and speed is small.

On speed mainly they fall down lamentably. The writer has before him the prints of propellers for two separate types of vessels. These prints state that at 90 r.p.m. the speed of the ship will be $10\frac{1}{2}$ knots. However, at this speed of propeller, she only makes in one case a fraction over 9, and in the other something short of 10. The designers are also off on slip in nearly every case. Under seagoing conditions the slip will run anywhere from ten to fifteen per cent over that estimated.

Why such a sounding of trumpets and blowing of horns over the trial trip speed, when as a matter of record very few of the freighters lately built come up to it after being in service? This is not due, either, to any inefficiency of those who operate the vessels. On one steamer lately from the East Coast to San Francisco, her speed averaged 9 knots only, at revolutions claimed to be sufficient to drive her 10. She was not dirty, having lately been docked and painted.

This sort of stuff is "bunk" pure and simple, and serves no useful object that the writer can see. It also puts those who handle the vessel in a bad light, especially as regards speed, and many an engineer has been told about the wonderful pace she set up on the trial trip, which by the way, is seldom verified or checked for accuracy, and is generally run with the ship light and under ideal conditions.

Warm "Cooling Water"

It seems regrettable that steamship designers were not as a class more practical men. If so the writer is sure they would not design the many contraptions they now encumber boats with. Things which appear all right theoretically, but under the iron of practical work they fall down lamentably. Take, for instance, many of the so-called "cooling water" systems installed on steamers. With a sea temperature of 56 Fahrenheit and an atmospheric one of around 60 Fahrenheit, the water is kept fine and cool, and plenty of it. However, when she is in low latitudes, with sea at 85 Fahrenheit and atmosphere around 98-104, then there is no cool

drinking water, and a howl goes up that the engineer doesn't want to supply it. In most cases had a little more thought been given to small things like this, it would be better for all.

Drains?

Running of scuppers and drains is also given too little thought. All that is believed necessary is to lead a pipe to let the water out, with no consideration as the possibility of foreign matter getting in and stopping it up. Incline is seldom or never considered, with the result that on some fine steamers a slight list to one side will cause drainage to back up into toilets, washrooms, etc.

Again, the writer knows of one very culpable mistake, where to put engine oil down below it is necessary to have the oil barrels hoisted up onto the promenade deck, and this always makes a mess.

Frozen Fittings

The writer had an incident come under his notice lately which shows the lack of good practical sense in designing. The cargo boom derricks were fitted with goose-neck irons bored to almost an exact size for the pintles. No provision for oiling was allowed for. There was absolutely no clearance, the fits being so tight. Result was that a careless and ignorant deck officer let these booms lay in their chocks for several weeks on the run home, and they "froze" fast, and when hoisted and swung over, the socket irons carried away, causing breakage and a sizeable bill for repairs, besides delaying the steamer. While the neglect of the deck officer is inexcusable, the designer who would allow such snug fits on derrick booms does not know the least thing of sea work and the action of salt air and changing climates on metals.

While good fits are admirable, the writer has noticed that in many cases the doors, drawers, lockers, etc., in a new boat are fitted with such an exactness that when they swell the slightest from damp and climatic changes they stick and bind, and then the cook uses his cleaver to open drawers, and the average seafarer uses any old thing handy to open a locker door with the result that in most cases damage is caused that a little thought might have prevented.

Simple Piping

In engine rooms also there are many cases of lack of thought and the old proverb might well be changed to "blessed be the drafts-

man who can make one pipe do where two did before."

It has been noticed that the best ship draftsmen are those who have had a few years at sea. Then they try to make things handy and simple. The man who doesn't know that a ship rolls and wallows when in service cannot be expected to design for such contingencies. In all cases simplicity is best, even if a fad has to be sacrificed. Of course, it is hard to make things fool proof. The writer has labored for years to evolve things that would hold up under the average ship worker's handling. The only thing he ever designed which they could not break was a pile-driver monkey, and they dropped that overboard.

It has often been asserted by members of labor unions that the independent worker is not efficient. The writer is of a different opinion, and recent experience bears out his belief.

A week after the late maritime strike, we came into San Francisco with a steamer from east coast ports. Calling at San Pedro, were told by the delegates about the strike. As we were on the regular pay, having signed on previous to the first of May, we were not molested, but were told all about what the U. S. S. B. and the steamship owners were trying to do.

Among other things we were told that we would have to work ten hours a day at sea. Also nine hours in port. That a cut of 35 per cent was ordered. That no decent man would accept work under those conditions, etc., etc., ad nauseam.

Arriving at San Francisco the facts were ascertained. The writer was of the opinion that the strike was ill-advised and uncalled for; that the M. E. B. A., of which he was a member, had no authority to call a strike; that the association had committed a grave error in identifying itself with labor unions. He also saw steamers under foreign flags being loaded, while American ships lay idle. Like a few more, he felt that the country needed men to help rehabilitate the world, instead of pulling down an already tottering structure. He therefore withdrew from the Marine Engineers' Association, giving his reasons therefor.

The next day he was asked to take out a steamer under the "open shop" plan. Speaking to three other engineers who were also disposed to exercise their right to sell their labor and skill as best pleased them,

all agreed to take the places offered. A few more men were found, some of them particularly bright American boys, and we went aboard the vessel, one of the U. S. S. B. boats of the 7500 D. W. type, triple expansion engines, Scotch marine boilers, with the usual auxiliaries of refrigeration, electric plant, etc.

With a very few hours to prepare for the voyage, about six to be exact, a start was made one fine morning. She got away from the dock under her own power, without a tug, and steamed down the bay and out over the bar without any particular difficulty that was noticed. True, we did not attempt to break her "trial trip" record, but we did turn her up to within a few revolutions of it, at that.

Crossed out to sea about noon, and headed south. All went fine. The new men soon picked up the way to fire so as to avoid smoke. The oilers were a bit awkward at the start, and lost and bent a few squirt cans, but within three days all was turning as steady and nice as any job that ever sailed the seven seas.

And the writer must say this, too. The men as a class were eminently superior to the average oiler, water-tender or firemen which he had to put up with under union labor rules.

As a whole they were more amenable to discipline and proper treatment. They did not go around with a chip on their shoulders, trying to show that they were just as good as the next man if not a — sight better. Neither did they assume any sychophantic manner, but did their work with an air of willingness and pride in it, unhampered by union labor regulations. In fact, some of them were former members of different maritime unions, and had drawn away owing to the acts of idiotic labor leaders. They seemed as a whole more manlike and self-respecting. Not only in the engine department, but all over the ship. The cooks, sailors, boys and all each tried to do what was right and proper, and were considerate of each other.

The art of steering straight was a bit hard to master by a few, but these were instructed by those who could steer, and in a day or two, she was doing as well as most ships. One thing, if a man was corrected for any mistake, he did not at once

spring it on the officer that he was a union man and knew his business. The writer will say right here that many union men formerly held their jobs on the strength of their membership, not on their ability.

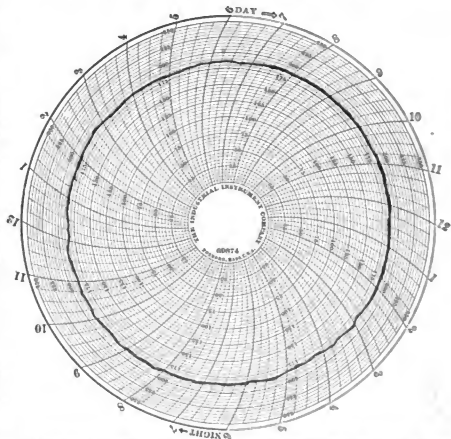
Well, we went along steadily day after day. Press news came in by wireless of sabotage on other ships, but we went on the even tenor of our way, doing each day's work as it came along, and all seeming to be imbued with the idea we were helping humanity toward a solution of some of the difficulties and trouble caused by the war and its aftermath.

Our first run was some three thousand miles. This was made without a stop or slow on account of any engine or boiler troubles. No terrible mental strain was undergone by the chief. He slept well at night, perfectly sure of the loyalty of his boys, and they all seemed anxious to show that they could do their work like Americans, without having to first obtain the permission of a blatant mouthed labor agitator, whose first and only thought was for himself.

For over forty years the writer

has been chief, off and on. During that whole time he has never had a better engine room crew to sail with. He has sailed with union ones, and in the old days with some of the old timers who attended to their duty. Unfortunately the past few voyages, or since unionism had become rampant, discomfort, incivility, incompetence, drunkenness, carelessness and a general air of indifference as regards the job was almost always apparent. The trouble seemed to be that a certain class were drunken with an abnormal sense of their individuality. They seemed to have the idea of most ignorant men, that the only way to show their "independence" was to shirk work all they could; to use indecent and profane language; in season and out of season to prate about "overtime."

The change to peace and quietness of an "open shop" job was marked, and any good engineer who tries it once will be loath to go back to the days when the "delegat" would come aboard and tell him what had to be and had not to be done. It is to be hoped those days are gone forever.



Reproduction of a steam chart taken during regular operation of a Shipping Board steamer under the open shop plan with an untrained American crew. The steam line speaks for itself.

MARINE BORERS AT CROCKETT

By GEORGE M. ROLPH

General Manager California and Hawaiian Sugar Refining Corporation

THE convenience of having both rail and water together in an industry while always quite expensive, sometimes has unexpected hazards. The old factory and warehouse were constructed out over the water supported upon green piling. The first piles for the support of the old Starr Flour Mill were driven in 1881. It was thirty-six years later that we began the reconstruction of the old plant in January, 1917. Precedent is sometimes a good thing to follow and at times very dangerous. It was so with us. We made a very careful examination of the foundations of the old structures and found the piling in good condition—green sticks—well preserved and there appeared no good reason for not continuing to use green piling since the old ones were sound at the end of thirty-six years.

However, we had not progressed far in the reconstruction program when in breaking off piles that interfered with the new work we discovered a few sickly teredos. On this meager information the type of construction to be used was immediately changed adding approximately \$2,000,000 to the cost of the improvements. While a small matter at the time, subsequent events have proven to us that it was the most far reaching decision that had to be made and averted a near catastrophe. It has been much easier to explain why the cost ran far above the preliminary estimates than it would be now to explain the failure of the foundations while during the past year structures have failed all about us. Yet some of our neighbors stated as late as the spring of 1919 that their structures were not attacked by marine borers. Today green piling is destroyed within a year.

Many engineers yet do not seem to grasp the real significance of this sudden attack by marine borers in the upper waters of the San Francisco Bay. This subject alone is a very large one so without taking too much of your time I'll briefly sketch the situation as it is today. Following a talk given before the American Society of Civil Engineers last June a committee of engineers got together and organized what is now known as the San Francisco Bay Marine Piling Com-

In the course of an interesting address on sugar refining delivered before the San Francisco section of the American Society of Mechanical Engineers, Mr. George M. Rolph, general manager of the California & Hawaiian Sugar Refining Corporation, digressed to make some remarks on pile foundations and the danger from teredo invasion, which will be of great interest to the readers of Pacific Marine Review. We are therefore printing these remarks herewith as a separate article.

mittee affiliated with the American Wood Preservers' Association to make a survey of the situation. The committee published its first preliminary report in January of this year. A great interest was evidenced in the work making it possible for the committee to raise the sum of \$30,000 to continue the work over the next three years, the money being subscribed by those who are more or less interested in waterfront construction.

In undertaking the work the cooperation of the scientists of the University of California was enlisted and particularly that of Dr. Charles A. Kofoid, head of the Department of Zoology, who is probably the greatest authority in this country on the subject of marine borers. All available data and investigation that have ever been made have been brought together by the committee and they find that there has been very little research work on the subject ever undertaken, but a great deal has been accomplished in hashing and rehashing such meager information as exists at this time.

The committee has established observation posts throughout the entire bay region receiving samples and installing testing pieces at each place. In the investigation made they found that the borers which caused the tremendous damage in the upper regions of San Francisco Bay are newcomers to our shore, never having been reported at any former time. They have been proven to be the same species, namely, the teredo navalis, which has been

causing great damage in the dikes of Holland for the past centuries, and readily adapt themselves to living in both brackish and salt water. Heretofore it has been generally supposed that marine borers would not be active in water containing less than 1 per cent of salt, but we find them living and thriving and breeding at Crockett when the water is practically fresh so that the former theories have had to be discarded and we have been forced to the conclusion that comparatively little is known authoritatively on the subject. It does seem, however, that from this time on the upper bay water will be infested by these borers.

Some of the creosote piling driven in the bay region in recent years is now subjected to attack by borers. This indicates that the creosote oil was in some way defective. A close study showed that the manufacturers were removing the "dye basis" portion of the oil, i. e., naphthalene, anthracene, pyridine, acridine, quinoline and aniline, all of which constitute the heavier oils, leaving the lighter oils which more readily leach out, or in reality the creosote oil now on the market is a by-product and not a whole oil. The committee is now revising specifications so as to insure the user that he is getting the best grade possible, not however without vociferous objections on the part of some of the producers.

Great interest has attached to the work being accomplished by the committee throughout the country. The National Research Council is cooperating, looking into conditions in Eastern harbors, notably New York, as the conditions there are analogous to those in the vicinity of Crockett and with the foreign species active in American waters it would seem possible that all of our coastal waters may ultimately be infested causing the loss of many millions of dollars.

The borers do their destructive work very rapidly as test timbers 6 inches by 8 inches dimension were completely destroyed between August and the latter part of November, so that any piling that may chance to be exposed for even a brief period of three or four months during the fall season would surely be destroyed.

SHIPPING INDUSTRY OF NORWAY

THE neutral country that probably suffered the heaviest material losses in the war was Norway. During the years of submarine warfare 829 Norwegian ships, with a total tonnage of 1,239,000 tons, were destroyed, while the number of Norwegian sailors killed amounted to 1162. This was a higher percentage of tonnage losses per capita and a higher number of sailors killed in proportion to the population than any other country, neutral or belligerent, suffered.

One of the most important problems facing Norway after the war was the rebuilding of her merchant marine and the last report of the Norwegian Shipowners' Association, just published and covering the period August 1, 1920, to May 1, 1921, gives a vivid picture of how the work has been carried on to accomplish this end.

According to the report, the tonnage of the Norwegian merchant marine (including sailing vessels) varied as follows for the period 1913-1920:

1913.....	1,771,137 tons
1914.....	1,891,468 tons
1915.....	2,083,409 tons
1916.....	2,085,542 tons
1917.....	3,294,978 tons
1918.....	1,778,076 tons
1919.....	1,939,459 tons
1920.....	2,195,855 tons

As this table shows the losses of the war, to some extent, were counterbalanced by the acquisition of new tonnage in 1919 and 1920, but naturally at a heavy economic sacrifice. New contracts were placed in England after the war, and the report states that the tonnage of the ships covered by these contracts amounted to about one million tons d. w. by July 1, 1920. On account of the increased cost of production and the unfavorable exchange situation the contracts became unexpectedly expensive to the owners and the Shipowners' Association opened negotiations with the English yards in order to have a number of the contracts cancelled. In most cases the yards were unwilling to cancel, however, and in the fall of 1920 the Norwegian government floated a loan of \$20,000,000 in the United States in order to help the shipowners to pay the installments due on the contracts. Expensive as this new tonnage will be to Norway it has the enormous advantage of being fully modern equipment.

Norway is in some respects the greatest ship owning nation in the world, having usually in modern times the largest amount of tonnage per capita. During the war she suffered more from submarine activities and mines than any other neutral nation. The article herewith is the last annual report of the Norwegian Shipowners' Association and shows the amount of Norway's war losses and the efforts which Norway has made to replace the lost tonnage.

The Shipowners' Association has also carried on negotiations with Germany concerning compensation for ships sunk in the war and with the United States about compensation for new buildings requisitioned for war purposes. Much work has been spent on the liquidation of the government's interference with the merchant marine in regard to extraordinary taxes, maximum freights and similar measures and the association has succeeded in having some of the government measures restricting the shipping industry of the country abolished.

Owing to the enormous decline of the freight market, the Norwegian shipowners have been forced to lay up a large percentage of their tonnage. According to the report of the association, 344 Norwegian ships with a tonnage of 848,927 tons were lying idle by April 1, 1921, and it is believed that the amount laid up has grown by this time to about 1,000,000 tons d. w., i. e., about a fourth of the total merchant marine of Norway. According to reports from abroad this amount seems to

correspond to the average number of ships laid up in other shipping countries.

This situation has brought about a large unemployment of sailors. The number of unemployed sailors was figured at between 3000 and 4000 men by February 1 of this year. Several shipowners have given large contributions for the help of the unemployed and various works have been started to meet the emergency.

The report gives some interesting information about the radio service aboard the Norwegian ships. It appears that 337 of the 446 ships over 1600 tons were equipped with wireless. Of ships below 1600 tons, 33 had a radio station and of new building 57 were planned with this equipment. The number of ships over 1600 tons having no radio service is rapidly decreasing. Negotiations have been carried on by Norway with the British foreign office in regard to the British radio law, aiming to obtain some modifications in the law's application to foreign vessels. These negotiations are still proceeding.

The decline of the freight market forced the shipowners to go to a reduction of wages which resulted in an extensive sailors' strike in the beginning of May. The shipowners claimed a reduction of wages of 33 per cent. The strike has just ended and by official arbitration a compromise was reached by which wages were reduced 12 per cent immediately and additionally 5 per cent for sailors and stokers, and 12 per cent for engineers, from December 1st of this year. This agreement refers to employes in the coast traffic only, while a somewhat similar agreement for employes in the foreign traffic is expected to be reached in the immediate future.



United States minesweeper Pelican. Had it not been for the activities during the war of this and similar boats, the maritime losses would undoubtedly have been much higher.

NEW 6000-TON FLOATING DOCK

Sparrow's Point Plant, Bethlehem Shipbuilding Corporation

THE Bethlehem Shipbuilding Corporation, Ltd., completed in February of this year their second floating drydock at the Sparrow's Point Plant, Sparrow's Point, Maryland, the construction of which was a part of the original project for the operation of two docks at that point, within the Baltimore district. The first floating dock at Sparrow's Point was put in operation in March, 1919, and has a lifting capacity of 20,000 tons.

The new dock has a capacity of 6000 tons, is 418 feet in length by 100 feet in width and is suitable for taking a vessel of 20-foot draft. It is located alongside of the 20,000-ton dock, making use of the pier and bulkhead planned and constructed for this purpose when the concrete work for the larger dock was put in. The piers at either side of the two docks have pile foundations and extend out into the bay a distance of 1260 feet. Material in the new dock is handled by means of a locomotive crane.

In type of construction the new dock is similar to the 20,000-ton dock, being of the pontoon type, with individual wooden pontoons and continuous side wings of steel. There are eleven pontoons, which are attached to the side wings in such a manner that the wings act as continuous girders extending the full length of the dock. Each pontoon is divided into two compartments by a watertight bulkhead passing through its center, lengthwise of the dock, and has a centrifugal pump located in each compartment for use in emptying the pontoons and raising the dock. The pumps are electrically driven, being direct-con-



The 6000-ton floating drydock at Sparrow's Point plant of the Bethlehem Shipbuilding Corporation taken from the inshore end of the slip with the first vessel docked.

nected to motors vertically mounted in watertight casings on the docks of the side wings.

A double control house on shore, from which the motors are controlled, houses the electrical switching apparatus for both the 20,000-ton dock and the 6,000-ton dock. Electrical connections are such that by means of individual switches the pumps of any pontoon can be operated independently of those of the others, or by means of a master switch the pumps of all pontoons can be operated simultaneously. This feature provides means whereby the stresses in the vessel being docked may be equalized utilizing the individual control and bringing a decreased or increased upward pressure to bear on certain pontoons, as required.

For filling the pontoons and submerging the dock, a gate valve is located in each end of each pontoon so arranged that the water is allowed to enter through the pump ports but is by-passed into the dock to avoid passing through the pumps. Suitable screens are provided to prevent any material entering that would interfere with the operation of the pumps. Operation of the gate valves is by hand from hand-wheels located on the decks of the wings.

The wings are 30 feet high and 12 feet wide at the base. They are of watertight construction and communicate at the base with the compartments of the pontoons. The dock is moored to the pier and bulkhead by moorings of steel construction anchored in the concrete.

Three electrically driven gypsies are located on the deck of each side wing for the purpose of warping ships into the dock, a double bitt being installed at each gypsy for use as a fair lead. The electric motors for driving the gypsy heads are located in the wings below the decks and are direct-connected by shafting and gears to the gypsies.

William T. Donnelly, consulting engineer, of New York, prepared the plans for the dock and the construction work was done by the Sparrow's Point Plant of the Bethlehem Shipbuilding Corporation, Ltd. The first vessel docked was the *Higo*, on February 15. The operation of the dock has been very successful and its completion materially adds to the facilities of Sparrow's Point for the quick handling of marine repair jobs of any calibre.



View of the waterfront at Sparrow's Point plant showing the two floating drydocks

EUROPEAN MARINE NOTES

Exclusive Correspondence Pacific Marine Review

THERE is no trouble now to record in connection with maritime labor in Great Britain. It will be remembered that the ship owners a few months ago proposed wage reductions in all grades. These varied from a cut of £4/10/- per month for the ordinary seaman to proportionately larger sums upward. All grades of seafaring workers are organized in a trade union and they are federated by means of the Seafarers' Joint Council. The ship owners' demand for a cut was brought before the National Maritime Board upon which sit representatives of the maritime workers and the ship owners. Time was given for a discussion of the cut by the Seafarers' Joint Council and in the end every union agreed to a reduced cut to which the ship-owners assented, every union, that is, except the Cooks' and Stewards'. This union refused any compromise whatever and withdrew its labor from all ships which would not pay the old rates. That strike has now been called off. It was an utter and ignominious failure and the union has been wrecked by it. All grades therefore who can find work are now back and peace prevails in shipping so far as labor and capital are concerned.

The Coal Strike and Shipping

Only a day or two ago it was believed that the ballot which the British miners who are on strike were taking as to whether or not they would accept the coal owners' latest offer would result in an acceptance and an end to the strike. As a matter of fact the ballot has gone all the other way and even the miners' leaders are perplexed as to what to do next.

When hopes of peace ran high during the week preceding the ballot there was a strong demand in this country for ships to load coal in North America for our use. Prospective charters were, however, insistent that the vessels must be available for immediate or practically immediate loading. The supply of ships able to fulfill this stipulation was limited. Almost the only vessels which were in a position to accept such loading were those that were dispatched recently from Europe to North America by their owners in ballast. Even then it was feared that the ships would not be here before we resumed our own full coal production. Now, of course, there is no need for hurry and busi-

ness of this sort is proceeding quietly and at good rates.

Sir Owen Philipps Speaks

The Royal Mail Company despite the depressed condition of the shipping trade has again declared a good dividend. Sir Owen Philipps at the shareholders' meeting had a good deal to say about the general shipping situation. Referring to the cost of working ships now as compared with before the war, he showed that in 1913 the average price paid for coal by his company was \$4.60 per ton (that is, taking the present exchange at \$4.00 to £1). The average price paid for the coal by the company last year was \$24.00 per ton. This, of course, is only one item in the increased operating charges.

With regard to the outlook Sir Owen does not take a despondent view. Even the very large amount of tonnage now available, as compared with that which constituted the world's fleets in the immediate pre-war period, does not cause him any serious misgivings. It is a fact that the actual tonnage afloat today is probably 11,000,000 in excess of the tonnage in the water in 1914. Nor will there be disagreement with the statement that some millions of tons (the actual estimate is 8,000,000 tons) gross register is lying idle in the world's ports today. It might be imagined from these statistics that the outlook for the shipbuilding, as well as the shipping industries, was an exceedingly somber one. Certainly it is not bright.

It is necessary, however, to take into account the fact that if shipping is to be operated at a profit only the most modern and efficient vessels can be employed under competitive conditions. Merchant ships may not enter the obsolescent stage as rapidly as warships, but it is recognized that they age more rapidly from the economic standpoint than was formerly the case, and ships which are quite seaworthy have to be relegated to the scrap heap or sold because of the high operation cost in comparison with newer vessels. From the point of view of the excess of shipping over present or immediately prospective requirements it has to be noted, too, that the proportion of older vessels which has been retained in service, and are a legacy of the war, is considerably larger than would have been the case under normal condi-

tions. It is quite obvious that a considerable percentage of these will have to be weeded out, and that when this process has been completed the amount of tonnage available will not be in excess of the needs of the shipping industry.

P. and O. Changes

Beginning with the Khyber, which has been lying in the Royal Albert Dock for some months past, the P. & O. Company are inaugurating a system which may meet some opposition on the part of their older officers. The engineers' quarters are being moved from their present very inconvenient position and brought up to the boat deck alongside the executives, so that the engineers do not have to make their way through long alley-ways in the third class passengers' quarters, but drop straight down without any difficulty. As soon as the new arrangement is thoroughly tried out, other P. & O. ships are to be altered in the same way.

Pilferage

Those shipping managements which are putting into practice the recommendations contained in the interim report on pilferage of a committee of the Chamber of Shipping are believed to be well pleased with the results. One of the main recommendations of the committee was that careful tallies of cargo should be taken on loading and discharging, under the supervision of the ships' officers. It was then pointed out that dock authorities are inclined to discourage tallies, urging that they involve delays to the ships. It appears according to the Times Trades Supplement, that the various dock authorities not only discourage the tallying of cargo on behalf of the ships, but that they are inclined to refuse to make any tallies themselves. This tends to nullify the work on behalf of the ships. Goods may be tallied on discharge and may then be put into warehouse. Before they are collected the ships may have left the port, and the representatives of the ships will have no official receipts for the safety of the goods. If the goods are then delivered short, the responsibility is attributed to the ships. Only when the principle of giving receipts for goods by the various parties has been generally accepted is mastery of the pilferage problem to be anticipated.

Grain in Bulk

Representations are understood

to have been made lately on the subject of the regulations issued by the government of New South Wales respecting shifting boards for steamers carrying grain in bulk. The matter arose in connection with a decision of the government to permit the shipment of grain in bulk. Naturally, there is no objection whatever on the part of shipping managers to fit with shifting boards steamers which are intended to carry grain in bulk. That is the universal practice. But it is held by shipping men to be unnecessary to require shifting boards for vessels carrying grain in bags. Such regulations are not enforced in other trades. It is argued that there is no more need for the use of shifting boards when grain is carried in bags than there is in the case of general cargo, and it is pointed out that, in the South American trade, the transport of a certain percentage of grain in bags is considered to render unnecessary the requirements for shifting boards for the proportion of the cargo carried in bulk. The cost of fitting shifting boards in the case of a steamer of about 8,000 tons is put at about 2s. 6d. (say 50 cents) per ton. In addition, there is the loss of freight due to the weight and space lost by the fitting of the shifting boards, and the loss of time to the steamer while the work is being carried out. These two additional items are estimated to cost a further 2s. 6d. per ton, so it is argued that the ports of New South Wales are placed at a disadvantage in the export trade, as compared with other Australian ports, of at least 5s. per ton, for which there is no return whatever in safety or other desirable result. Shipping managers point out that where shifting boards have to be fitted, they cannot afford to load wheat in the ports of New South Wales at similar rates to those accepted for the ports of other States. They urge, therefore, that regulations which are considered by shipping men to be quite unnecessary and hampering to trade should be withdrawn.

Ex-Enemy Ships

Large numbers of German ships have been handed over to this country in connection with the repatriation agreement. The selling of these ships was put in the hands of Lord Inchcape who had special advantages for doing the work well. All these ships were advertised as being for sale to British nationals

only. It came, therefore, as a great surprise to find that a number of the later vessels offered have been sold back to Germans. When called over the coals about this, Lord Inchcape said that this had been done and he would defend it. The statement reads as follows:

With the exception of the *Herbert Horn*, they were advertised for sale to British nationals only, but they were unavailable for some months, as they were doing work for the League of Nations repatriating refugees in the Baltic. They are running under the German flag, manned by German crews, and will be so engaged for some time to come. They have never been under the British flag. They have been sold to a German buyer without hull examination, or anything else, for an uncommonly good price—for far more than I could ever have hoped to get from British buyers. The purchaser only gets delivery when the League of Nations is done with them. Meantime they are entirely at his risk. Cash for the entire purchase-money will be paid on the 24th inst, and the payment has been guaranteed by one of the big five British banks. From my exper-

ience no British buyers would have looked at the ships on such terms, and with so many vessels still available to British nationals I consider I would have been extremely foolish to have rejected the offer. Needless to say, the arrangement was made with the full concurrence of the Reparation Commission, for whom I am selling the German ships.

We can't go on holding up vessels indefinitely, incurring serious laying-up expenditures, and it has now been decided that after June 30 the market will be thrown open to the world for those ships left unsold to British buyers. What with E. P. D., income-tax, corporation tax, etc., the liquid resources of British ship-owners appear to be getting exhausted, to say nothing of shrinkage in trade, high costs of working, wages three times what they were before the war, ship-joiners out on strike for over seven months, necessitating vessels being sent to France, Germany, Belgium, and Holland for overhaul. During the last two years and a half I have sold altogether something like 600 craft for his Majesty's Government realizing about 60,000,000 sterling (say \$240,000,000).

Passing a Tow Line

ON the night of February 22, 1921, Captain Garland Rotch, of the American steamer *Montana*, picked up the British steamer *Grelarlie* with her propeller stripped, then towed her 1700 miles to Havre, France.

The high sea and darkness made the launching of a boat impossible. Captain Rotch had had no experience in towing, and after various unsuccessful attempts to pass a line to the *Grelarlie*, including the use of the Lyle line-throwing gun, he took advantage of the fact that the vessels, lying in the trough of the sea with no way on them, drifted at different rates of speed.

Following briefly, is the interesting method which he twice used with perfect success:

The slower drifting vessel, the *Grelarlie* in this case, floated out from her weather bow a small line, 120 fathoms long, kept afloat by buoys spaced at intervals of about 100 feet. When signaled that the line was out full length, the faster drifting vessel (the *Montana*) took position well to windward, parallel

with and about half a length ahead of the *Grelarlie*, then drifted down and picked up the buoyed line; a touch ahead on the engines would have put her ahead enough to drift clear had there been danger of collision.

Having secured the buoyed line the *Montana* steamed ahead to clear the *Grelarlie*, lines being passed meantime to get one strong enough to heave the heavy towing hawser, which was passed when the vessels were nearly in line.

The buoys carrying the floating line must not be so far apart that the line will sink between them and tend to draw them together, preventing it from floating out full length; at night the buoys should be white if possible so that they will show in the dark.

If the faster drifting vessel should be the disabled one, the other can take proper position to leeward and float out the line and when this is picked up by the disabled vessel, steam ahead to let her drift. (From U. S. Navy H. O. Pilot Chart for July, 1921.)

BOOK REVIEWS

The International Seamen's Code— 174 pages bound in green paper with black stampings. Published by the International Labor Office, Geneva. Price 2 shillings sixpence.

This booklet is a note addressed to the governments of the states members of the International Labor Organization, and it embraces information as to the progress which has been made in the investigations entrusted to the International Labor Office with regard to the preparation of a draft for an international seamen's code, its purpose being to present to the various governments all the information collected up to the present time which might be useful to them in the codification of their national laws relating to seamen.

All the documents bearing on this question have been collected in this volume in chronological order. These include first, the questionnaire which was sent out to governments before the Genoa session of the International Labor Conference; second, the opinions expressed by various governments as to the possibility of drawing up an international seamen's code and as to the principles upon which such a code should be constructed; third, the report of the commission sent up by the Genoa Conference to study this question; fourth, the discussion which took place at the Genoa Conference and the text of the resolution and recommendation adopted; fifth, the record of the first session of the Joint Maritime Commission which discussed the procedure to be followed by the International Labor Office in preparing the draft for a code. To these records are added the report and draft of the code prepared by the Joint Maritime Commission, and a historical note on former maritime codes.

This book will of course be circulated in the proper channels to the various maritime governments of the world and will undoubtedly be of great influence in shaping legislation. It is, therefore, highly important that all shipowners, operators and shippers generally should obtain a copy of the book as promptly as possible and study for themselves at first hand its analysis of the situation and recommendations for future action. There will probably be many details in the proposed draft of code which will be objectionable to various shipowners, and now is the time to register the objection for soon may come the time

when it will be a case of "forever after hold your peace."

A Text Book of Oceanography, by J. T. Jenkins, D. Sc., Ph. D.—200 pages with numerous diagrams and illustrations, bound in green buckram with black stampings. Published by E. P. Dutton & Company, New York. Price \$6.

The preface calls attention to the fact that, in spite of the great interest that maritime questions have always had for English speaking nations, there is no modern text book in English on the subject of oceanography. This book was designed to fill this gap and to meet the requirements of a text book for higher forms of preparatory schools, for teachers in training, and for students specializing in geography at the universities. The book contains a very select bibliography of the more important publications in the English language on the subject. It is completely indexed and very condensed in style, compressing into a small compass a tremendous amount of information on the physical geography of all the oceans.

Chapter I is devoted to an introduction and to general physical features of the sea. Chapter II is on oceanic deposits and bottom fauna. Chapter III is on the temperature of the sea; Chapter IV on waves and tides; Chapter V on ocean currents. Under this simple plan of division the lover of the sea will find his favorite analyzed, bisected and displayed to his view in all of her varying moods.

The book should be upon the shelf of every man who is interested in sea information.

A Manual of Marine Engineering, by A. E. Seaton. 1000 pages bound in red buckram with gold stampings, with numerous illustrations, working drawings and tables. Published by D. Van Nostrand Company, New York.

This eighteenth edition of Seaton's well known standard manual of marine engineering has been thoroughly revised, greatly enlarged, and in large part rewritten to bring it up to date. The additional material is contained to a great extent in appendices on such subjects as the marine Diesel oil engine, turbines on shipboard, superheated steam and superheaters, and the rules of the various classification societies for materials and construction in marine power plant work. The chapters are all brought up to date as much as possible in showing the im-

provements made in the various fittings for reciprocating engines and turbines, in auxiliaries, in propeller design, in boiler design, and in materials used by marine engineers. The book forms a complete record of the progress of the art of marine engineering.

Elements of Map Projection, by Charles H. Deetz, Cartographer, and Oscar S. Adams, Geodetic Computer. Special Publication No. 68. U. S. Coast and Geodetic Survey, Government Printing Office, Washington, 163 pages, 74 figures, and 8 folded plates. Price 50 cents.

This volume is a comprehensive treatise on all the more useful projections, presenting them in as simple a form as possible in their general characteristics, mathematical development and actual construction.

The whole field of cartography, with its component parts of history and surveys, map projection, compilation, nomenclature and reproduction is so important to the advancement of scientific geography that the selection of suitable map projections is receiving far more attention than was formerly accorded to it. The exigencies of the problem at hand can generally be met by special study, and as a rule, that system of projection can be adopted which is ideal or most useful for the area under consideration.

An interesting feature of the book is given in the frontispiece where a study of a suitable map projection for the United States is presented both by graphical illustration and statistics, including errors of scale, area, and azimuth, in four different projections. It is shown that the projection usually employed for this purpose has a scaling error of as much as 7 per cent. By the use of Albers projection the maximum error of scale can be reduced to 1 1/4 per cent, and the projection has the additional asset of equivalence of area. The authors believe that the latter system will soon come into use on account of its desirable properties and the simplicity of construction. Full description, mathematical development of the formulas and tables for the United States on an Albers projection are included in this publication.

The Mercator projection, useful for nautical charts, is presented with detailed and all necessary description, including formulas and tables. The chapter should interest

the mariner in a better understanding of the special properties of this projection concerning which there is much unnecessary abuse. This is followed by an approximate method for fixing positions at sea by wireless directional bearings.

On account of the extensive use of Mercator tables which have not been printed in sufficiently accurate form for 48 years, the book should meet a long-felt want. Nearly 15,000 nautical charts are prepared on this system of projection with a probable annual total of over 2,000,000. Under the subject "World Maps" the Mercator projection is again discussed for its usefulness in a continuous conformation mapping of the world, and its impossibilities when extended into the polar regions are explained by the statement that those localities are after all the best places to put the maximum distortion.

Generally our interests are centered between 65 degrees north latitude and 55 degrees south latitude, and it is in this belt that other projections present difficulties in spherical relations for world mapping that are not readily expressed in analytic terms. A better understanding of the border latitude scale of a Mercator map and the conformation property of the projection would obviate some of the criticism as to "misrepresentation of area."

All of the principal methods of projection largely used by cartographers are discussed and analyzed, but we are rather disappointed to see that no mention whatever is made of the system known as the Butterfly Projection, which has been attracting a large amount of attention on the Pacific Coast. The simplicity and the obvious usefulness of the latter method should recommend itself to all who are interested in obtaining a world map true to scale in a simple and very usable form.

The Marine Room of the Peabody Museum at Salem. By John Robinson, curator, 200 pages, and 65 pages of illustrations, bound in blue cloth with paper label, 7 by 10 inches. Edition of 1000 copies, of which 750 are for sale. Price \$4, by mail \$4.25. For sale by the museum, Salem, Massachusetts.

This is a handbook of the marine collections of the museum. Although the primary object of the publication was to describe the interesting and varied marine collections, there is a great deal of general information in which both the technician and casual reader will be interested.

The subject matter deals with the development of the sailing vessel from the Revolution to the end of the clipper ship era. Among the many illustrations are paintings of ships, models, whaling, naval engagements, foreign ports, old nautical instruments, portraits, figureheads and scrimshaw. There is a bibliography and an index containing 1475 references, among which are the names of 522 vessels. The engravings are especially well executed and form the most valuable feature of the book.

Handbook of Standard Details for Engineers, Draftsmen and Students. By Charles H. Hughes. 312 pages with numerous illustrations, diagrams and tables. Bound in green buckram with red stampings. Published by D. Appleton & Company, New York. Price \$6. A very useful and handy volume

by the author of the Handbook of Ship Calculations, Construction and Operation. The book is divided into eight sections, covering: I, Drawings; II, Fastenings; III, Power Transmission; IV, Pipe, Tubes and Fittings; V, Rope and Chain Fittings; VI, Miscellaneous Details; VII, Structural Details; VIII, Useful Tables.

This book should certainly find a very cordial welcome from mechanical and engineering draftsmen. It is very conveniently arranged, well indexed, and covers a sufficient variety of mechanical detail so that practically every problem coming to the designer of detail work would find either its exact equivalent or a comparable design with which to check the draftsman's work. The writer would have given a good deal for such a book when he himself was a draftsman.

ELECTRICAL SMELTING

THE Companhia Electro Metalurgica Brasileira and the Batcheller-McConnell Company, New York, have recently acquired from Mr. Frank Hodson, president of the Electric Furnace Construction Company, 908 Chestnut street, Philadelphia, and his Swedish associates, the exclusive rights and licenses for the State of Brazil for the well-known Gronwall type "Electro-Metal" electric smelting furnace.

Two large furnaces, each of 3000-kilowatt capacity, are at present being installed by the Brazilian Company, and it is probable a number of others will follow the original installation.

These are the first really commercial electric smelters to be erected on the western hemisphere, and they undoubtedly mark a new development in the steel trade. In Europe this type of furnace has been in successful operation for some years,

and of 27 furnaces installed in Sweden, Norway, Italy, Japan, etc., the total power capacity is no less than 99,700 kilowatts. Obviously it is time we investigated the possibilities here. Broadly speaking, the fundamentals which make such a plan feasible are: presence of fairly good ore and limestone near cheap electric power and the demand of steel and iron. Many parts of the Pacific Coast, some parts of the Adirondacks, and New Jersey have these fundamentals.

Mr. Frank Hodson, who is closely connected with the development of the "Electro-metal" smelting furnace, advises that a large western corporation will probably put in the first installation in the United States, and further states that several very large electric pig iron smelting installations will be proceeded with immediately when general business conditions improve.

ERRATA

On page 393 of the July issue of the Pacific Marine Review in the transcript of the abstract of the engineer's log of the Manulani the figures for draft were printed "28 feet 1 inch forward and 38 feet 2 inches aft." This should have read "28 feet 1 inch forward, 30 feet 2 inches aft."

In the same issue in the advertisement of the Bethlehem Shipbuilding Corporation the printer dropped a decimal point from the figures given for the average fuel oil consumption per I.H.P. of the tanker D. G. Scofield. This figure should have been "0.80."

We are glad to make this correction of these inadvertent errors.

PROPELLING MACHINERY OF THE U. S. S. TENNESSEE



The U. S. dreadnought Tennessee in the East River, New York

SINCE the U. S. S. Tennessee is the first battleship to be designed specifically for steam-electric propulsion (the New Mexico having been originally intended for turbine drive), her propelling equipment is of special interest. The general arrangement of her machinery is as follows:

Each turbine-generator unit with its exciters is located in a separate water-tight compartment, and its condensers, pumps, air ejectors and other auxiliaries in a compartment below. The four propeller motors occupy three water-tight compartments in the stern, the two inboard motors being in one, and an outboard motor in each of the other two. No other apparatus is in the motor compartments. The control room from which all of this machinery is controlled is also separate and water-tight, and is aft of the turbines and forward of the two inboard motors.

Turbine-Generators

Each turbine-generator unit consists of a single Westinghouse steam turbine directly connected to a 3-phase alternating-current generator, rated at 15,000 kv-a for continuous operation and delivering 3400-volt, 36-cycle current, at full speed.

The turbines are of the impulse-and-reaction type, and permit complete expansion of the steam in each casing. They are designed to take steam at 250 pounds gauge pressure

at the throttle, 50 degrees superheat, and 28½ inches vacuum. The steam, on entering the turbine, is first expanded in a set of nozzles, and then passes through a 2-row impulse wheel and through a high-pressure reaction stage. It then divides, and the two parts pass through low pressure reaction blading on opposite ends of the rotor, and exhaust into the condenser.

The speed of the turbine can be carried over a range of from 1500 to 2200 R. P. M. by means of a manually-operated governor. This governor is of the centrifugal type, but instead of being loaded by means of a spring, it is loaded by hydraulic pressure, the fluid being oil. The pressure of this oil is regulated by a valve in the control room, so that the turbine speed can be controlled at will from this point. The speed of the turbine depends upon the setting of this valve and will remain constant for a given setting regardless of the load.

The turbine has also an over-speed governor which will automatically shut it down in case of excessive speed. This governor can be manually operated at the turbine or by a wire pull from the control room.

Generators

The main generators, which are of Westinghouse make, are similar in design and construction to those used on land, except that special precautions have been taken to pro-

tect the windings from salt and moisture. The insulation is of the best known materials and is applied by thoroughly tried methods. Each coil was insulated by the vacuum-and-pressure method and then given several treatments of varnish and baked after each treatment. On completion, the entire winding was varnished and baked.

Ventilating air is blown through the stator coils by means of blowers mounted on the rotors, which provide sufficient air to keep the windings cool, under any condition. The air is drawn in at the bottom of the end bell, is forced axially through the machine, and is discharged radially through an opening in the top of the frame to ducts leading to the deck.

The rotor is of the totally closed type and is not ventilated internally. It is connected to the turbine by means of a flexible coupling which is enclosed in the bearing housing between the two machines.

The bearings of both the turbines and the generators are lubricated by oil under pressure from motor-driven rotary pumps. Should these pumps fail, similar pumps driven by steam turbines immediately start up automatically, so that no break will occur in the oil supply. Oil for the hydraulic governor is supplied from the same source.

(Continued on page 60, Industrial Section)

MARINE TERMINALS AND THE MOTOR DRAY

By H. McL. HARDING

Terminal Engineer of the City of New Haven, Connecticut

THE advent of the motor dray and tractors with trailers has resulted in modifications in marine terminal design.

These changes chiefly consist in there being greater widths of the waterfront spaces between the sheds and outside edge of the quay, between the sides of the sheds and the warehouses, and wider spaces between the ends of the adjoining sheds and the ends of the various warehouses, these increased areas being in addition to the present railway track spaces.

These changes, therefore, influence the location of sheds, warehouses and railway tracks and cross-overs. There are also changes in the designs of the power machinery whereby there are more transferring and handling machines, but each of less lifting capacity. Instead of two-ton cranes, 1500 to 2000 pounds may be used, but more of them. The increase of space is

to reduce the congestion which would otherwise occur, due to the increased area which would be required for these drays and trailers. The success of mechanical hoisting and conveying depends upon many small mechanical appliances instead of a few of large capacity.

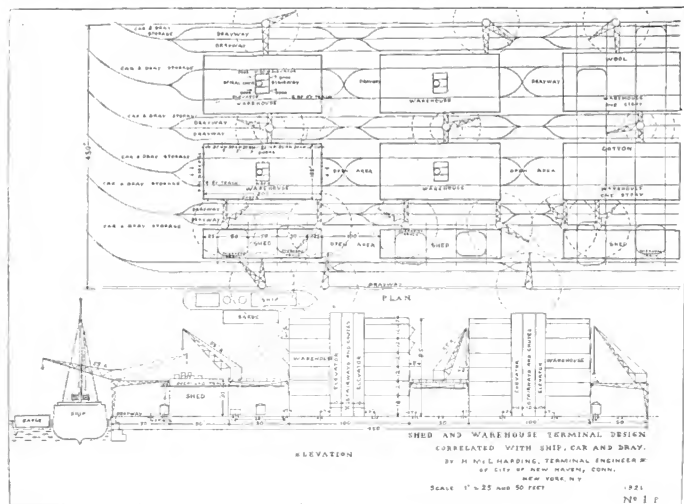
At a marine terminal, there must be co-ordination between dray and vessel, especially as pertaining to outbound freight. For this outbound freight the ship may be considered an equivalent to the railway outbound freight platform but served by machinery.

As is well known, it is generally not necessary to assort the outbound freight according to marks and cross marks, and therefore the outbound cars and drays, where the nature of the material will permit, are unloaded directly into the ship. At certain ports more or less of the outbound freight is loaded directly between the barges and lighters

and the ships, and not only into ocean ships, but also into coastwise and river vessels. From the large motor drays the outbound freight can be transferred directly into the ships as from the open platform cars. Inbound freight generally is placed in the shed for assorting and distribution. To do this, more space is necessary alongside ship, and more space should be reserved than usual for these drays.

Water Side Spaces

It is desirable as a general rule to limit the width between the quay edge and the shed to fifty feet, this dimension being usually controlled by the length of the jib of the traveling gantry crane. Where there have been within this width three parallel railway tracks, these may be reduced to two. This width of 50 feet may be divided for the two railway tracks and overhang of cars into 25 feet, and for the motor drays 25 feet.



There should be many access and egress drayways for the motor drays at the terminal with waiting areas and also drayways to the railway tracks in remote sections of the terminal. It should be possible for drays to encircle the sheds and warehouses. The dray approaches and drayways should be many and their locating as carefully studied as that of the railway tracks.

Drays should not enter the sheds but should be able to pass around the outside of the sheds. There should be waiting areas at both ends of sheds and warehouses. Between the sheds and warehouses, in the spaces served by the traveling gantry jib cranes or by the overhead bridge cranes supporting revolving jib cranes, there should be areas for dray loading and unloading. All parts of the quay except within the sheds should be accessible to the drays.

If the cargo be of coarse freight or freight similar to locomotive boilers, it can be stored in the open

ferring and handling most economically and rapidly. At Manchester, England, freight is moved from these one-story warehouses to any part of the terminal for about 12 cents per ton. It may be that most of the future warehouses used exclusively as marine terminals may be in accordance with some such design or what may be called combined warehouses.

At such warehouses drays are loaded and unloaded entirely by machinery at the least expense. It generally is not necessary for the drays to enter the warehouses, as the loads are lifted by machinery from the dray outside the warehouses and transferred and tiered within the warehouse by the same machinery. Drays while not permitted within the sheds may, under restrictions, enter warehouses.

A warehouse thus designed is simple, rapidly constructed and of low initial cost. There are four nearly blank walls, few windows in the sides, the light being chiefly from

ical appliances for which no floor space need be reserved. The delay to the dray at the terminal is far less than when the dray has to be lifted to floors or elevators and then often unloaded and the goods lifted and tiered by human labor.

Motor Dray Capacity

There are said to be at the present time no less than 1,100,000 commercial motor drays in use in the United States, having a combined carrying capacity of 990,000,000 tons annually. The number is daily being increased. Of dray fleet owners there are 31,000 of three or more commercial cars, 12,000 of three or more trucks and about 13,000 of 5 to 10 truck owners and truck fleets. In New York State there are over 125,000 commercial cars. Many passenger cars, of which there are 3,500,000 in the United States, often carry a number of light packages.

There are now being established motor dray terminals and sub or intermediate dray terminals. In Connecticut there are about 25,000 com-



Pier B, Seattle, showing four Shipping Board liners assigned to the Admiral Line at the pier on the same day. The steamers are, right to left, the passenger and freight liners Westchester, Keystone State and Silver State and the freighter Edmore.

spaces between the ends of the sheds and warehouses.

One-story Warehouse

Where there is a large proportionate quantity of any one commodity, as wool, tea, rice, sugar, boxes of lemons, tiers of tobacco, boxes of tea, bales of cotton, barrels of liquids or boxes of dry goods, then such freight is stored in the special warehouses with all the space above one floor, and with no overhead floors. The height of the space may be fifty feet. This allows of high tiering by machinery, trans-

skylights in the roof. Such a warehouse with a capacity equal to a five-story warehouse would cost about \$90,000 instead of \$475,000 for the five-story warehouse. The lower floor being on the ground will sustain almost any load.

In some warehouses the load on this ground floor has been as much as 30 tons per square foot. For certain classes of commodities, there are special racks or containers. It is plainly evident that a clear height of 40 feet storage greatly facilitates the operation of overhead mechan-

mercial cars which could have a daily carrying capacity of 75,000 tons, and for the year 22,500,000 tons. This is more than the total railway freight passing through the city of New Haven. The above figures of twenty-two millions of tons are given to show what an enormous volume of freight can, by motor drays, converge to the New Haven port terminals, and what extensive terminal facilities will be required along the curved waterfront of the harbor of New Haven Bay. The solution of the railway problem may

be the motor dray and trailers for freight transport for an average radius of fifty miles.

Conclusions

1.—More ground space is required at terminals due to the advent of the motor dray.

2.—Marine terminal mechanical appliances should be more in number but each of less hoisting capacity.

3.—By means of one-vertical-space warehouses there will be less delay and waiting for the drays at the terminals, and less human labor of lifting.

4.—When this vast army of motor drays, having a combined capacity approaching that of the railways, becomes consolidated into large corporations, and the time of transport

between factory and dray is measured by one day for one course, and many new marine terminals are installed with this one day course in view, then the freight problem for all but the long-hauls will be simplified and solved. The enormous motor dray tonnage, however, indicates future possibilities, rather than present probabilities.

ADMIRAL LINE EXPANSION

WHEN, early in July, four large United States Shipping Board vessels lay at one time at Pier B of the port of Seattle, the largest commercial wharf in the world, a graphic picture was presented of the rapid progress being made in the effort to win ascendancy for the American flag in the commerce of the North Pacific, via the Great Circle trade route to and from the Orient. The mammoth terminal, constructed by Seattle at a cost of more than \$5,000,000, is just

ers Wenatchee, Keystone State and Silver State and the freighter Edmore, all Shipping Board vessels allocated to the Admiral Line for operation. They represent an investment by the people of the United States of \$27,000,000; an investment which is being kept moving by the Admiral Line to bring in large dividends in the form of increased commerce with the Orient. The Keystone State will sail on July 30 and the Wenatchee will sail August 27, after an overhauling to correct mi-

Line officials that American ships can gain control of the trans-Pacific passenger and freight business originating in the United States, which constitutes the bulk of the traffic.

Pier B, which can accommodate many more than the four large vessels shown in the picture, was recently completed at a cost of \$2,500,000. It is 2500 feet long and 365 feet wide, larger in area than Pier A, the first constructed, which is 2540 feet long by 310 feet wide. The wharves are equipped with transit



Pier B, Seattle, showing four Shipping Board liners assigned to the Admiral Line at the pier on the same day. The steamers are, right to left, the passenger and freight liners Wenatchee, Keystone State and Silver State and the freighter Edmore.

tifying the faith of its builders by becoming the home berth of an increasing fleet of American ships engaged in trans-Pacific commerce.

Pier B of the great terminal is being used as the American terminus of the Admiral Line, which inaugurated the all-American passenger and freight service between Puget Sound and Oriental ports with the sailing of the Wenatchee April 9 followed by the Silver State July 9. The four ships which lay at Pier B were the passenger and freight lin-

nor defects developed in her first voyage.

It is expected that additional vessels will be allocated to the Admiral Line for this service, making the capacity for passengers and freight of the American Line far greater than that of any of its foreign competitors, which in the past have carried the great American commerce out of the Puget Sound gateway. The vessels which have so far sailed in the service have carried good cargoes, encouraging the belief of Admiral

sheds and the most modern machinery, insuring rapid and economical handling of cargo and giving American ships a decided advantage in this respect over Canadian and British ships in British Columbia ports.

With a splendid fleet, to be still further augmented, and the best terminal facilities in the world, the Admiral Line looks for rapid realization of its purpose to gain ascendancy for the American flag on the Great Circle trade route.

(Continued from page 487)

hours, using only three of the ships' hatches. It is costing the steamship company about thirty cents a ton to discharge these sugar cargoes at Crockett, and it is stated that this is much lower than present practice at any other dock.

The warehouses are designed to support a live load on the floor of one ton per square foot. The foundation is reinforced concrete piling on the outer portion adjacent to deep water, cressoted piles capped with concrete in the zone immediately back of the concrete piles, and on the inner side green piling capped with concrete. On the land side of this warehouse is direct railway connection with transcontinental lines. The conveyor system in the warehouse has a rated capacity for loading 35 cars a day, and in rush seasons as high as 50 cars have been shipped in a single day.

Refining

The sacks of raw sugar passing into the refinery on the fourth floor of the great melt house are opened as they come off the conveyors and their contents dumped through a grating into the raw sugar bin. Any lumps that may have been formed are run through a crusher. The empty raw sugar bags are turned and thrown onto a conveyor which carries them to the sack laundry. With a melt of 2000 tons a day run through, there remains in the empty bags approximately 10,000 pounds of raw sugar, which is entirely recovered from the laundry in the form of sweet water.

Quite a problem developed at Crockett in the drying of these sacks and a very ingenious chain conveyor was worked out for carrying them through the upper portion of the boiler room of the power plant, thereby utilizing the waste heat of the boilers to dry the bags.

After drying, the bags are repaired, printed, fitted with a liner, and re-used for packing refined sugar.

Centrifugals

The raw sugar passes from openings in the bottom of the bin onto scraper conveyors and thence onto elevators to the top of the melt house where it is mixed with washed syrup in mills called minglers. This syrup softens the hard molasses coating around the sugar crystals and forms the sugar into a mushy mass called magma. The magma now passes to the centrifugal machine, and the syrup is spun off, carrying with it a small part of the impurities.

The centrifugals used at Crockett are of a modified and improved Watson-Laidlaw type, which is self-discharging and largely automatic in its whole action. These machines are motor-driven. They have a diameter of 48 inches and a vertical height of 24 inches. The bottom is open, the opening being 33½ inches in diameter. The lower 15½ inches of the basket tapers at an angle of 60 degrees, and the calculated capacity is 11.9 cubic feet with a magma wall thickness of 6 inches. The automatic regulation is arranged on a time schedule. Five seconds after the centrifugal is started the basket is running 250 revolutions per minute, and the charge of magma is admitted onto a distributing disk. The charge flows for 20 seconds, at the end of which time the basket is revolving at a speed of 650 revolutions per minute. While the calculated capacity is 11.9 cubic feet, the rapid acceleration during a charge is constantly throwing out the syrup through the basket, so that it has been found practicable to operate the centrifugal at an actual capacity of slightly more than 15 cubic feet. When the full charge is in, it requires about 45 seconds to spin off the syrup, during which time the basket comes to its full speed of 870 revolutions per minute.

The washing water is then applied for a period of 75 to 90 seconds, the quantity of the water being measured, amounting to approximately 34 pounds per charge. The water is applied through two nozzles so that a fine spray of cold water reaches every part of the sugar wall under a constant pressure of 40 pounds. After the water is shut off, spinning continues for 30 seconds to dry the sugar. The motor is then shut off and the brake applied, two minutes being required to bring the machine to a stop. Just before the centrifugal comes to a dead stop the sugar wall drops off through the bottom of the basket into the washed sugar bin, the entire load discharging in two seconds.

This automatic discharging and the other advantages of this new type enable it to handle 25 per cent more charges per 23-hour day than the old closed-bottom, belt-driven type. The charge of magma weighs approximately 1220 pounds, from which 710 pounds of washed sugar is recovered. Raw sugar entering the cut-in station has an average purity of 96½ per cent. Washed sugar leaving the centrifugals is approximately 99 per cent pure. The loss of weight through the washing process varies from 8 to 12 per cent. There are 22 centrifugals of this type operating at Crockett, each of which has a daily capacity of 100 tons of raw sugar. The old type had a capacity of 50 tons, and one man operates as many of the new type as of the old so that the labor cost is cut in half by the installation of these new machines, and at the same time much floor space is conserved.

Pre-melting

The sugar from the washed sugar bin passes to the pre-melters, where it is melted in hot water mixed with sweet water, a by-product of the filtering process to be described later. The melters are heated and the temperature regulated through open steam injectors, and it is of the utmost importance that the quantity of sugar and water should be so proportioned that the resulting mixture will be of a constant density and as nearly as possible of a constant temperature. The liquor then passes to the main melting tanks where a final adjustment of the density and temperature is made and the liquor screened to take out such impurities as burlap, etc. One gallon of this raw liquor at a density of 62 brix weighs 10.85 pounds and contains 6.73 pounds of solid.

Sweetland Filters

The liquor now passes to cast iron blow-up tanks 10 feet in diameter, 6 feet high, with a conical bottom where lime and kieselsguhr are added and the mixture run into the Sweetland presses. The Sweetland press is a modern innovation in the sugar refinery, taking the place of the old bag filter system. All of the sugar liquors in refineries were formerly run through bags in the same way that the housewife clarifies her jelly. It was a slow, tedious and exceedingly disagreeable task.

The Sweetland filters are cylindrical metal casings, each having a capacity of 630 gallons. Each case contains a filtering area of 1044 square feet. This is arranged in 72 leaves, each with an area of 14½ square feet. These leaves are arranged in pairs with a hollow space between, each leaf having a filter cloth of light cotton twill stretched over a screen. As the liquor is admitted to the presses the kieselsguhr forms a cake of filter on the cloth, and all of the insoluble impurities are removed as the liquor is forced through this filter medium. The presses will handle raw liquor equivalent to 100 tons of raw sugar per 24-hour

(Continued on page 62, Industrial Section)

MARINE INSURANCE

CHARLES F. HOWELL
Eastern Contributing Editor

Model Bill Amended

As a result of important conferences between advocates and critics of the so-called Model Bill for the District of Columbia, which is designed to better marine insurance conditions in this country, the skies have been cleared and the way smoothed for enthusiastic concerted action in furtherance of the passage of the measure. As it now stands it is a different bill, in several particulars, from the one originally introduced by Representative George W. Edmonds, and the alterations that have been made make it decidedly more acceptable to shipowners and marine insurance brokers in that several features objected to by the latter have been removed. The original bill was withdrawn in committee and a revamped one substituted. The altered measure has been favorably reported by the House committee on the District of Columbia and urged for passage, and the outlook for its success is extremely bright. A similar bill is being advocated in the Senate.

Four Fundamental Changes

Representative Focht submitted the report for the committee, and in it he stated that the following four fundamental changes in American marine insurance are anticipated from the application of the bill:

1. The substitution of a system of net profits taxation on marine insurance in place of the present system of taxation on gross premiums.
2. Establishment of the multiple insurance principles, so that American fire, marine and fire-marine companies may be permitted to transact all kinds of insurance except life insurance and fidelity and surety bonding.
3. Enlargement of reinsurance facilities.
4. Removal of existing limitations on the financial operations of companies which hamper their work in foreign fields.

The fight on the original measure was conducted by shipowners and marine insurance brokers on the ground that it would place an obstacle in the way of building up our desired merchant marine by adding a burden to the already heavy competitive overhead of the former, and worked a hardship to brokers in that it imposed upon them a tax of 2½

per cent on the gross premiums of all marine insurance shipped abroad and placed with unauthorized foreign companies; and also because it permitted the marine insurance companies to join combinations in rate-making that would bring them under construction as in violation of the anti-trust laws of several states. In more than one respect it was a drawn battle, as the critics secure what they wanted, and the underwriters feel that they themselves have sacrificed little that was essential. The principal changes were as regards Sections 20, 21 and 26. The first two were stricken out altogether to satisfy objections to alleged "monopoly" menaces. Section 20 read:

That any company organized or admitted to write marine insurance within the district may become a party to any association, syndicate, exchange, or bureau organized for concerted action with respect to any one or more for the following purposes: The supervision or performance of a maintenance, inspection, and loss survey service; the supervision or conduct of salvage operations; the formulation, adoption, or enforcement of policy forms and conditions; the application of correct and just principles; the formulation and enforcement of uniform, efficient, and economical practices; the recommendation, approval, or making of rates of premium; and the safeguarding and legitimate advancement of the business in the interest of the members.

May Join Syndicates

Section 21 was as follows:

That any company organized or admitted to write marine insurance or reinsurance within the district may become a party to any association, syndicate, exchange, or bureau whose membership consists of companies or associations authorized to write marine insurance or reinsurance under the laws of the United States or of any state, territory, district, or possession thereof, and which is organized for the following purposes: To transact a marine insurance and reinsurance business in the United States and/or in foreign countries and to reinsure or otherwise apportion among its membership the risks undertaken by such association or any of the component members.

Chapter IX treats of the prohibition of unauthorized insurance and

the licensing of brokers in certain cities, and in this Section 22 (old Section 24) has the following added: "Provided that, for the purposes of this chapter, any office outside of the United States of an insurer organized under the laws of any foreign country, whether said insurer be licensed to do business in the United States or not, shall be deemed and held to be an insurer not authorized to transact the business of insurance in the district."

Sections Are Amended

The first part of Section 23 (old Section 25) was amended to read as follows:

That the superintendent, in consideration of the yearly payment of \$100, shall issue to any person or corporation who is trustworthy and is competent to transact a marine insurance business in such manner as to safeguard the interests of the insured and who maintains in this district a regular office for the transaction of an insurance brokerage business, a license, revocable for cause by the superintendent, permitting the party named in such license to act within the district as an agent for the assured or broker to solicit or negotiate or place contracts of marine insurance with corporations, partnerships, associations, Lloyd's individual underwriters, and inter-insurers, which are not authorized to transact the business of insurance in this district, and shall renew the same annually, unless revoked for cause. Provided, that, with respect to insurers organized under the laws of any foreign country and duly licensed to transact the business of insurance in any state or territory of the United States and with respect to insurers organized under the laws of any state or territory of the United States, said license shall not issue unless the superintendent shall be satisfied that said insurers show within the United States the same standards of solvency as would be required if said insurers were licensed at the time of issue of said license to transact the business of marine insurance in the district.

Section 24 (old Section 26) was amended, after the word "district" in line 7, to read as follows, so that any licensed representative of an unauthorized insurer will come under these restrictions:

Shall maintain in good faith an office in the district, (2) keep in said

FIREMAN'S FUND

Insures Hulls, Cargoes,

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714-715 BOARD OF TRADE BUILDING
PORTLAND, ORE.

FRANK G. TAYLOR, GENERAL AGENT FOR WASHINGTON, OREGON, ALASKA

office a complete book of record of the marine insurance transacted by, through or with his or its assistants with unauthorized insurers, showing (a) a brief description for identification of the subject matter and kind of the insurance, (b) the voyage insured, or, if for time, the date and the date of its termination, (c) the name of the beneficial insured, (d) the amount insured with unauthorized insurers, (e) the rate of premium, (f) the gross premium payable therefor. Such book of record shall also contain statements in the same details of all such insurances cancelled or on which premiums have been increased or reduced (including laying-up returns) and the amounts of additional or of return premiums thereon; (3) keep in said office such additional record of the insurance, including the names of the corporations, partnerships, associations, persons, Lloyd's underwriters, or inter-insurers, and the amount insured by each. The books of record and all supplementing records shall be open at all times to the inspection of and examination by the superintendent of insurance, or anyone appointed by him for said purpose. The data as herein outlined shall be furnished to the superintendent within one month following his request therefor and upon the form furnished by him.

Stowage of Grain

Not one man in a thousand understands the importance of fitting a ship for the carrying of grain in bulk, according to the recently expressed opinion of an experienced insurance surveyor. He says that once a grain cargo starts to shift it is beyond control, and that vessels should be loaded without a perceptible list of any kind. A ship should remain without a list for the first several days at sea, as in that time the cargo will settle down and any empty spaces left by bad trimming in the lower holds will draw from the feeders until the space is filled.

Should a grain-laden vessel be exposed to a bunker list before the cargo has settled down it will be difficult to again get her in proper trim, as grain will move with a 12-degree list and will continue to increase until it is too late to do anything toward righting the ship. Bad trimming results from inferior labor and this latter economic condition is one of the greatest menaces to the welfare of our country today. It is necessary in order to get a grain ship trimmed and beam filled to keep a man in the holds continuously, as otherwise ignorant and indifferent laborers will merely build a wall of grain around the hatch combings, and, thus concealed from sight, slight their work and eventually dig their way out and report the compartment trimmed. On several occasions it has been found that sufficient empty space remained in the waists for the accommodation of all the grain in the feeders. The consequence of this is that as soon as a vessel experiences bad weather the grain in the feeders will find its way into the lee waists, causing the ship to list, and also causing the grain to move away from the longitudinal shifting board on one side, leaving the entire weight of the cargo pressing against the filling boards between the beams. These latter are rarely secured to stand any pressure, as they are merely pieces of boards fitted between the beams and driven into place with a hammer; they are only intended to keep the top of the cargo from shifting. As a matter of fact, this latter arrangement is a mistake; filling pieces should be provided when the ship is under course of construction, or at least provision made for their installation.

The "Vanishing" Ships

You could not get a marine underwriter to "fall" for the stuff that has been appearing in the daily

press about the mysterious disappearance of large numbers of vessels of late, and the likelihood of their having been captured by pirates. Asked about it, he merely grins and pronounces the cryptic judgment, "bunk." In point of fact, the lists of vessel-disappearances that have been appearing in the newspapers include catastrophes that date back several years. Marine underwriters insist that, apart from the heavy total losses that resulted from the great storms of early February, the number of disappearances has been no more unusual this year than at any other time. It is the regular thing to learn of a foundering, about so often, but investigation generally proves conclusively that it resulted from defective stowage or unseaworthiness. The total disappearance of the Hewitt several weeks ago, to which so many references have been made, is accounted for by the underwriters in the eloquent fact that she carried a tremendous cargo of sulphur. She was the property of the Union Sulphur Company, and was lost while sailing along Atlantic Coast between Sabine and Boston. All the insurance money has been paid. In a word, shippers need have no apprehension about pirates or the Soviets or whoever else is credited with stealing ships in these latter days. If they will just help in getting a proper headline bill through Congress they will have started machinery that will reduce the number of "vanishing ships" automatically and effectively.

Anti-Pilferage Organization

Once again a concerted effort is being launched against the steady stream of losses from theft and pilferage. This time it is made up of marine underwriters and a set of powerful allies drafted from various commercial bodies, and the methods to be employed are considerably dif-

INSURANCE COMPANY

Freights and Disbursements

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ATLANTIC MARINE DEPARTMENT
72 BEAVER STREET NEW YORK

AND BRITISH COLUMBIA, 309 COLMAN BUILDING, SEATTLE, WASHINGTON

ferent from any tried in the past.

A membership corporation has been formed under the laws of New Jersey, to be known as the Trade Protective Association, Inc., and its purpose is the improvement of conditions in transportation and the effecting of reforms calculated to minimize ocean freight thieving. The corporation will co-operate with the public authorities and with various transportation lines and, by centralizing the efforts of a number of insurance offices and trade bodies, it is believed that a powerful influence can be exerted in the correction of pilferage evils in connection with the transportation of merchandise to and from the port of New York. Among the trade organizations that have agreed to co-operate are the following: Merchants Association of New York; Importers and Exporters Association; Chamber of Commerce of the State of New York; Tanner's Council; Manufacturers' Export Association; and the National Association of Manufacturers. The funds for the support of the corporation are to be subscribed by underwriters of New York City, and the sum of \$50,000 has been fixed as an initial levy for the purpose. This has already been assured by agreements entered into by leading underwriting offices of the city. Members of the corporation (other than the original incorporators) will be elected by vote of the board of directors, the latter body to consist of fifteen members or more as may seem advisable, the majority of which to consist of underwriters because of the fact that most of the theft and pilferage losses falls on them. Albert R. Lee has been appointed general manager and will have entire charge of the executive work of the organization. The various insurance offices subscribing to the corporation agree to report to the general manager all theft and pilferage losses

in excess of a minimum sum to be agreed upon, and to pay a fee for the investigation and classification of such losses, reports being forthcoming to them in consideration of such fees. To secure a maximum of effectiveness the various subscribers agree to carry out the recommendations of the general manager and to co-operate among themselves in the correction of abuses by approximate differentials in rates or such other methods as may be decided upon. Special investigations will be made as requested, the requesting office to pay a fee for the work. It is expected that the current expenses of the corporation will be met by these fees for regular and special investigations and classifications. An effort will be made to place upon the carriers such legal and moral responsibility as is properly theirs.

Tonnage Values Reduced

Marine underwriters are gratified by the action of the new Shipping Board in marking off nearly \$2,000,000,000 from the total value of that organization's vessels, as it carries an admission that these ships are not worth over 35 per cent of their construction cost. However, insurers much prefer, as a rule, increases in valuations, as they cannot afford to use present selling values as bases for issuing policies so long as repair costs remain as high as they are. To be sure, underwriters are not being called upon very often right now to insure newly sold Shipping Board vessels, but they have to bear in mind the effect of the board's reductions upon other shipowners who may feel they should have reduced valuations when they come to renew their insurances.

Premature Bills of Lading

The custom now in vogue of shipowners giving shipowners indemnity against loss in return for a clean bill of lading is being seriously ob-

jected to by British marine underwriters. They insist that this is equivalent to a shipowner acknowledging the good condition of goods delivered to his vessel, for which he receives assurance of inviolability against damage that may arise should the merchandise prove unsound. The loss falls upon the underwriter, as the assumption is direct that the damage occurred in the course of the voyage, since, according to the bill of lading, it had not occurred prior to the delivery of the goods aboard the vessel. But in view of the fact that it is entirely possible that the damage may have occurred before the insurance attached, the underwriters can scarcely be blamed for objecting to any such arrangement between shipper and shipowner.

The Lay-up Return Clause

There is more or less misunderstanding with respect to the interpretation of the American Hull Underwriters' Association lay-up return clause, which involves the liability of the underwriter for return premium in event of a vessel being laid up for repairs—a claim under the policy. This clause does not specifically exclude lay-ups due to policy claims, and yet inferentially by the very nature of such a return they are excluded. Under an annual hull policy the premium is earned as soon as the insurance attaches, just as under a voyage policy, and the rate is based upon the knowledge that the vessel will be at sea a portion of the period and in port a portion, and that some time will probably be passed in repair yards in consequence of casualties. But lay-ups in port due to lack of freights or for like reasons can not be foreseen and are not taken into account in making the rates; they are, as a matter of fact, conditions foreign to the purpose of a vessel. If a vessel were to sus-

tain serious damage on the first day of the attachment of the insurance she might, very possibly, be laid up for the balance of the policy term and, if the return clause applied, the underwriter would be out practically all of his premium and be further liable for heavy loss payments. It is being felt by underwriters that the most advisable thing to do is to insert a provision on their lay-up return clause to the effect that no return will be paid if the vessel is laid up under average.

Business Most Dull

If one could interview every underwriter of the Pacific Coast he probably would discover a large majority of the belief that marine business never was so dull in all their experience as it is today. Except for a slight quickening of exports to Japan there is little to record in the way of new business, and on the other hand, the Australian preferential tariff for imperial products has hurt trade with the commonwealth considerably.

Some feelers have been put out recently by brokers for Japanese manufactured silk insurance. Hereafter that has been placed largely in New York, where most of the large importers have their headquarters. One San Francisco underwriter inquired of his principals in the East regarding the silk and was advised that the company practically had withdrawn from the business. Stuff such as fine kimonos can be stolen so easily, for their small bulk makes detection difficult, that the hazard is too great in these days of pilferage.

A Sermon on Exchange

As to Australian trade, we Americans well may ask ourselves what we expect. Can we hope to sell goods indefinitely without buying in return? No country can settle its trade balances in gold unless it produces, as does Alaska, gold as a commodity; goods and not gold buys other goods. One chief reason for the continued decline in Australian business is found in statistics for the first ten months of the fiscal year, cabled by Trade Commissioner Ferrin July 2. He reports that the value of imports for that period was £143,000,000, of which £29,000,000 was from America; whereas exports totaled £109,000,000, of which £7,000,000 was to America. That is, the unfavorable balance was £34,000,000; and almost two-thirds of that was incurred in trade with the United States. Mr. Ferrin does add, however, that the present tendency

is toward a decrease in both imports and exports, which has been manifested, so far as tonnage is concerned, for some time, and which is a curious feature of Australian trade today.

It is quite true that the underwriter may plead "not guilty;" he does not buy and sell, and he has little occasion to concern himself with the volume and value of Australian exports, which are insured for the most part at the point of origin. But the underwriter and everyone else will find his business in better condition if he will endeavor to spread the gospel of the essential reciprocal nature of foreign trade. The preaching of that gospel is a task of the greatest magnitude, because many American business men who engaged extensively in foreign trade for the first time during the war, when the demand always was for exports, actually do not understand the simplest mechanics of exchange. They think they can sell without ever buying.

Cargo Insurance Better

An almost imperceptible improvement in trans-Pacific cargo insurance was to be observed in July. Some underwriters were inclined to attribute the change to Japan's better tone, but steamship men were not inclined to be optimistic. Having better opportunity to observe just what cargo was moving, they quickly discovered that increased offerings were not what could be described as general, but consisted largely of cotton, cedar logs, old newspapers, etc., and later in the month of gasoline.

Some of this cotton was placed in the Pacific market, although usually cotton goes to the two Eastern ports. Most of it moved by vessels of Struthers & Dixon from Los Angeles, which not only handles the Imperial Valley crop, but also is taking Gulf bales that in the old days would have gone to Seattle or San Francisco. It is worthy of note, too, that the large quantities loaded within the last few months by vessels of the Osaka Shosen Kaisha have moved through Los Angeles harbor.

The Prince of Monaco

Those who do not "believe in" mines as effective agencies in the sinking of vessels today—in short, those who fear that many a scuttled ship blames the Kaiser unjustly—doubtless have good reason for their belief. Sinkings by mines became too popular in the Mediterranean, with the result that the London mar-

ket declined to insure any more Greek vessels, and rumors are abroad that other Mediterranean nations will find London deaf to their proffers. Nevertheless, it is worthy of note that a great authority, probably the greatest authority of the world, the Prince of Monaco, who came to the United States a few months ago to receive the Alexander Agassiz medal from the National Academy of Science for his work in oceanography, was quoted as saying that he believed that as many ships had been sunk by mines since the war as during its progress, but that he did not include submarine sinkings. Such a statement by a world-authority deserves attention.

A \$400,000 Fire

A loss estimated to be \$400,000 was caused by a fire at the Harbor Island plant of the East Waterway Warehouse & Dock Company, Seattle, July 9. All property was fully covered by insurance. A 900-foot dock, part of a 600-foot transit shed, three freight cars and quantities of lumber and piling were destroyed. The Shipping Board freighter West Ison, operated by Struthers & Dixon, was lying at the wharf when the fire broke out, but she was cut loose and saved from any damage more serious than blistered paint.

After the failure of Rogers Brown & Company, which incorporated the dock company as a subsidiary, the properties passed into the hands of the First National Bank of San Francisco. Three hundred men of the U. S. S. Idaho assisted greatly in checking the fire.

\$100,000 to West Jester

A settlement has been arrived at by the Toyo Kisen Kaisha and Captain M. S. Harloe, Shipping Board representative in Japan, and C. E. Harvey, vice-president of Frank Waterhouse & Company, operators of the Shipping Board freighter West Jester, whereby the T. K. K. pays yen 200,000, or approximately \$100,000, to satisfy a salvage claim against the Kiyo Maru. About a year ago the Kiyo Maru, then on a voyage from Yokohama to Kobe, caught fire off Homoku and her crew lost control when fire forced the engine-room men to the decks. The O. S. K. steamship Africa Maru rescued the passengers, who were trapped aboard the Kiyo owing to the life-boats having burned; and the West Jester, answering a call for help, went alongside the Kiyo and turned her fire-hose on the burning ship. All night long the West Jester fought the fire.



Import and Export Rates

The ten months' fight of the Pacific Coast for rectification of import and export railroad rates, which were thrown into confusion by the increases of last August, has been rewarded with a large measure of success. Announcement was made early in July by all railroads east of Chicago that they would make effective the Chicago rates on a long list of commodities. Steel alone has not been reduced, but in the case of this important commodity a Suez reduction has affected Panama, with a consequent reaction on overland business. As things stand today, the Pacific Coast has little opportunity to go into Pittsburgh, and the North Atlantic-Far East situation is too unstable to make prophecy attractive.

Clover Leaf the Lever

To the continued effort of the Western Pacific is to be attributed much of the success of the Pacific Coast in obtaining these reductions. In seeking to extend the Chicago rates to the east of that city, the Western Pacific found an outlet in the Clover Leaf Railroad. Despite the refusal of the New York Central to acquiesce and the fear of other lines to antagonize that group, the Clover Leaf, standing alone, made a rate of \$3.65, as against \$4.33½ quoted by the other railroads, on automobiles from Detroit. Although the Clover Leaf was interested primarily in motor cars, it nevertheless agreed to publish other rates as well. The reduction opened the way from Detroit to the Pacific Coast via the Missouri Pacific. In order to give the Northern lines an opening, the Chicago, Terre Haute and Southeastern closed the gap between the Clover Leaf and Chicago.

In the meantime an effort had been made to enter Pittsburgh over the Wheeling and Lake Erie and the Pittsburgh and West Virginia, the latter of which is the old Wabash Terminal. It was ready to make reductions, but the Wheeling and Lake Erie hung back, and Pittsburgh remained closed to Pacific Coast business.

But the Michigan Central found the Clover Leaf automobile rate something to reckon with, and finally, like one card falling against another, the railroads toppled, with the eventual result that rectification has been made.

Just what business the Pacific Coast may expect is problematical. There is general recognition that the opening of the Panama Canal has definitely diverted a large portion of Atlantic-Oriental business through the ports of the Eastern seaboard, especially New York. Much of the old traffic, therefore, cannot possibly be regained, barring an actual closing of the Panama Canal by slides, as happened in 1915 and 1916. But a considerable amount of tonnage legitimately belongs to ports of the Pacific, despite the severe competition of the direct all-water steamship lines, and this business, which the Pacific Coast was compelled to forego because of the attitude of the Eastern railroads, now may begin to flow back in its old channel.

Why They Hung Back

The Eastern railroads had refused to reduce the import and export rates because of more than one reason. The short haul to the Eastern seaboard at local rates was attractive. Besides that, the Eastern lines chose to make reductions conditional upon changes in division of revenue, whereas the transcontinental roads held that the two questions necessarily were separate and should be decided each upon its merits. In this case both foreign and domestic traffic were involved, and the competition of intercoastal steamship lines, which not only took business from the transcontinental companies but also supplied the large consuming markets of the East directly, taking Pacific products directly into New York, Philadelphia, Boston and Baltimore without giving Eastern railroads an opportunity to benefit from the business, aided materially in forcing all railroads to make common cause. Although the New York Central lines, for example, might

handle California fruits from New York to Cleveland, they were losing the large volume of business destined immediately for New York; such roads as the Clover Leaf, on the other hand, instead of handling carload lots from St. Louis to the Lakes, were receiving no more than switching business in Cleveland itself.

That I. C. C. Puzzle

Reference was made to the case of steel. This requires a more detailed explanation. Due apparently to a Suez reduction, the New York-Far East lines have cut their rate to \$13 a long ton, a reduction of \$3. This is equivalent to \$11.60 a short ton. The Pittsburgh-New York rate is \$7.60, the total, Pittsburgh-Yokohama, being \$19.20. For several weeks the Pacific Coast-Orient water rate has been \$5.88, which is about the minimum that could be expected, and an additional reduction of \$3, in order to meet the Atlantic cut, would be quite out of the question, even though a rate of \$5 on knocked-down steel cars was recently published. In order for the old rate of \$5.88 to be maintained, therefore, the railroads would be compelled to quote \$13.32 transcontinental, or 66.6 cents a hundred, as against 71 cents Chicago and 80 cents Pittsburgh.

But some ruling or other of the Interstate Commerce Commission, the details of which appear obscure, holds that a differential of 9 cents shall be maintained, so that a reduction of the Pittsburgh rate to 66.6 cents would force Chicago down to 57.6, a cut of 13.4. In view of the effect that such a cut would have on the existing rate structure, it is probable that the Pacific Coast will be compelled to forego Pittsburgh business, but that the Western lines will be able to enter Chicago on equal terms with the Atlantic, provided that a rate of 66.6 cents be made.

It's a Weary World

Yet the general ocean freight situation is so uncertain that this discussion is scarcely more than guesswork. Panama hinges upon Suez, as several steamship lines have discov-

ered to their chagrin, and transcontinental-Pacific business hinges upon Panama; the Pacific West-bound Conference, moreover, is sadly disrupted, and the North Atlantic-Far East is approximately as sedate as a herd of wild horses. In view of these facts, snow is expected over the Middle West in January.

By and large, the steel rate tangle is favorable to United States Steel. That corporation has mills in the Chicago, Pittsburgh and Birmingham districts; the independents, however, generally cluster about Pittsburgh, and they therefore have only the one route, Pittsburgh-Atlantic-Far East, as opposed to the corporation's Birmingham-Gulf-Far East or Chicago-Pacific-Far East or Pittsburgh-Atlantic. So long as a differential exists in favor of Chicago and Birmingham, the corporation will be in a position to command business that naturally wishes to move via a Gulf or Pacific port.

Faster and More Regular

There is some traffic that does prefer to go by one of those routes, especially by the latter. The frequency of sailings by fast steamships from the Pacific Coast and the dependability of schedules, which are maintained to the hour and minute, contribute to give the West a decided advantage in some respects. The Atlantic-Orient vessels are freighters pure and simple; on the Pacific, however, one finds, in addition to the usual cargo-carrier, such fast combination vessels as those of the Shipping Board, T. K. K., O. S. K., N. Y. K., and Canadian Pacific. And with few exceptions they sail at the precise hour of schedule, whereas there have been some marked failures in that respect on the Atlantic, one recent steamer having sailed twenty-one days behind time.

One important result of the import and export reductions will be the loss by Canadian railroads of the advantage they have had over American lines, for the Canadian companies applied their rates through to the Atlantic seaboard, while the American stopped at Chicago.

The Rate Changes

The following are the rate changes announced early in July, to be effective as soon as Tariff 29-H could be amended:

(Rate in cents a hundred pounds)			
Item	Commodity	New Rate	Old
40	Agricultural imple-		
	ments	115	133½
47	Bottles	125	
55	Canned goods	120	133½
60	Chocolate	165	200
65	Dry goods	145	160

70	Glass	110	146½
75	Glass	100	133½
85	Road machinery	115	133½
87	Ink	150	
150	Lime	80	86½
155	Machinery	115	133½
160	Sewing machines	115	146½
172	Motorcycles	325	
180	Oil well supplies	115	133½
185	Paint	80	93½
190	Paper	100	120
198	Pianos	240	
200	Plumbers' goods	140	166½
205	Railway equipm't.	87½	100
	(axles, etc.)		
210	Cars and parts	87½	100
220	Locomotives and		
	parts	87½	100
225	Roofing	100	120
235	Rope	85	93½
240	Soap	115	133½
255	Starch	110	120
260	Heating apparatus	140	166½
265	Tires	250	333½
270	Tobacco, mfd.	155	180
275	Tobacco, unmfd.	150	186½
280	Automobiles	365	433½
285	Automobiles	315	366½
290	Wagons, etc.	160	186½
292	Trailers, etc.	200	
315	All commodity	200	233½

Other changes, too long to be given in detail, apply to poles, boilers for export, foil, culvert sheets, iron flooring, condensed milk, wood pulp and pulp-board, all exports; and hemp and other fibers for import. Those interested may obtain information of any railroad office.

Rail Rates Down

Announcement has been made of a reduction in the railroad rate on canned salmon for export, Seattle to Atlantic and Gulf ports, carload lots, from \$1.16 to 87½ cents. Prior to the reduction the 87½-cent rate was effective to Chicago, but local rates from that city to the seaboard made the average cost \$1.16. As a result much salmon was diverted to water shipment.

Through rates on Northwestern lumber to the Atlantic have been established by the railroads. Boston and New England generally receive a rate of 95 cents a hundred as against \$1.06½; New York territory, 90 cents as against \$1.06½. These reductions were forced by water competition. A through rate of 86 cents has been made to Central Association territory, applying in all cases when the present combination rate is not lower than the new. Savings will be effected approximately as follows: to New England, \$2.87 a thousand feet; to New York, \$4.12 a thousand; to Buffalo and Pittsburgh, \$2 a thousand.

Robert B. Allen of Seattle, secretary and manager of the West Coast Lumbermen's Association, said: "It is a step in the right direction. We do not regard the reductions as sufficient, however, to restore the parity that formerly existed in rates from the Pacific Coast and from the southern pine districts to the common markets of the East. Nor do we believe the reductions sufficient to give back to the railroads much of the lumber business that is now going to the Atlantic Coast by water. It is progress, nevertheless, and our association has heard the news with deep interest."

Import Rates Reduced

Reduced rates on import shipments of fibers, oils, butter and poultry from Pacific Coast ports to points east of Chicago and north of the Ohio River have been announced by transcontinental railroads, effective August 3. In the following schedule the first item is the commodity, and the figures show the minimum carload weight, the old rate and the new:

Fibers, 40,000; \$1; 85 cents. Oils, in packages, 40,000, or in tank cars, capacity of cars; \$1.20; \$1.05. Butter and dressed poultry, 24,000; \$3.33½; \$2.30.

Reduced rail rates announced last month on beans, canned goods, dried fruit, etc., California to Eastern territory, will become effective August 22.

Freight Report

San Francisco, July 13, 1921.

Since our last circular of June 14, there has been great activity in chartering for grain from the North and barley from San Francisco.

Northern Grain & Warehouse Company chartered about 6000 tons of space on the motorship George Washington from Portland to U. K. continent at 57/6, with the option of loading barley at San Francisco at the same rate. Balfour, Guthrie & Company chartered a Japanese steamer, unnamed, at 55/—, Kerr, Gifford & Company chartered steamer Meiwei Maru also at 55/—. The Northern Grain & Warehouse Company chartered Japanese steamer Baltimore Maru, and one unnamed, as yet, at 55/—, Balfour, Guthrie & Company chartered British steamer Bengloe at 55/— for one port, and 56/3 for two ports, U. K. Continent, and another Japanese steamer at 57/6. Pacific Grain Company chartered United States Shipping Board steamer at a reported rate of 60/—, although the Shipping Board official here gives the rate as hav-

ing been 65/—, From San Francisco, Strauss & Company chartered French sailer L'Hermite to U. K. Continent H. A. or D. at 55/—, and after the 15th of June several liners were arranging space at 60/—, and in two cases for special ports as high as 62/6 was paid. E. L. Eyre & Company chartered space for 6000 tons on the motorship Theodore Roosevelt at 60/—, followed a few days later by a chartering of Japanese steamer Tokufuku Maru at 57/6 for one port and 60/— for two ports by Strauss & Company, and yesterday this same firm chartered a British steamer, not yet named, at a reported rate of 65/— for two ports U. K.-Continent.

The English barley market has become stronger, having moved up from 47/— a quarter to 50/—, which allowed the regular liners to quickly fill up space for U. K. ports at 62/6; and 65/— is now the working rate for parcels.

Our belief is that there will be active chartering from this time on, especially from here, and also from Portland as soon as the new crop wheat is rushed in.

The banks evidently are not going to advance money to farmers to hold their grain for speculative purposes, which means that the farmers will have to sell as soon as it is ready for the market.

We fully expect 65/— to be the regular rate, and it might be even higher if the United States Shipping Board should eventually make up its mind to change its charter

rates, which are 65/— to one port U. K.-Continent and 67/6 for two ports.

We regret that lumber freights are still ruling so low that we have barely a few charters to report, with the exception of a demand for sailing vessels for lumber from the North to San Pedro caused by the tie-up of our steam schooners on account of the prevailing strike of engineers.

Japanese steamers Aden Maru and Denmark Maru were chartered by the American Trading Company for lumber to China or Japan at \$12 a thousand feet. The rates are now supposed to be about \$11.50, as the rates for wheat from Portland to Japan have been lowered to \$6 instead of \$7 as before. For West Coast, South America, schooner Resolute was chartered at \$18 to Callao by Mohns Commercial Company and Mr. Comyn's schooner Rosamond, which had been laid up for a while at Sausalito, succeeded in getting \$20 a thousand also to Callao to fill a special order by Mr. Seaborn of Seattle. American steamer Honolulu has been chartered to load lumber from Grays Harbor and Puget Sound to New York at \$17.50 a thousand feet. The business could no doubt be repeated.

We have heard of no sales or time charters since our last report, although we hear from Europe that steamers and sailors are being sold at very low prices.

PAGE BROTHERS,
BROKERS.

cations give the totals as 792 vessels each exceeding 1000 gross of 2,699,464 tons.)

"The eight-hour day has been abandoned for one of nine or ten hours by five of the largest shipbuilding companies in the Bay of Tokio, who had previously been compelled to concede to their men the privilege of an eight-hour day. It is further reported that the Yokohama Dockyard, which recently dismissed 2000 men, will probably discharge an additional 1000 men."

At the middle of June, 52 vessels of 283,780 tons were under construction or were to be laid down, but 85 per cent of the tonnage was for builder's account. The slump in shipbuilding has led yards to undertake more general work, the Osaka Iron Works and Yokohama Dock Company, for example, having gone into the manufacture of electrical machinery, bridge materials, etc., and Kawasaki having arranged to build airplanes.

According to a report prepared by the Far Eastern Division of the Department of Commerce, the increasing cost of labor in Japan will modify her ability to compete with other nations. Approximately 60 per cent of the workers in Japan have been women up to recent times, and their lack of organization and assertiveness has tended to minimize labor disturbances. The recent increase, however, in the variety and growth of industries, such as iron and steel manufacture, in which female labor cannot be profitably utilized, will have a strong tendency to modify this advantage. A new and significant factor is the formation of labor unions and the growth in influence of such organizations.

Current Work

Five vessels exceeding 1000 tons gross were launched during May, as follows: Mitsubishi, one for the O. S. K.; Asano, one for the T. K. K.; Nitta, one for builder's account; Osaka Iron Works, one for Harata; Kawasaki, one for builder's account. The five aggregated 25,580 tons gross. Up to the end of May 25 vessels of 1000 gross tons or more, aggregating 135,150 tons gross, had been launched since January 1, as compared with 93 vessels of 433,265 for the first five months of 1920. At the first of June the Asano yard was leading with 48,200 gross tons of shipping under construction; Mitsubishi, Nagasaki was second with 45,220, and Kawasaki third with 32,000.

Duties on shipbuilding materials

In Oriental Yards

Japanese Building

"While Japan was able last year to maintain third place in the list of the world's tonnage producers, and although there is still a large volume of work in hand, it is reported by leading exponents of the industry that competition from other countries in the future may result in the Japanese shipbuilding output being placed in the fifth or sixth position," says the bulletin of the Atlantic Coast Shipbuilders' Association in reviewing conditions abroad. "This is largely due to her unfavorable situation with respect to material, and is also aggravated by the lowering of the differential in wages, which have risen to three or four times the pre-war rates, while general labor efficiency has been largely reduced as a result of the reduction in working hours. With these conditions to face, competition with for-

eign rivals will be extremely difficult. There is also a tendency among Japanese shipowners to place orders abroad, and it is a significant fact that several well-known companies have ordered ships from foreign yards during the past year. In order to meet foreign competition it will be necessary to have the cost of materials reduced to the utmost, while on the other hand, the efficiency of workers must be increased or wages will have to be reduced. At the present time there are under Japanese registry a total of 2933 vessels, representing 3,012,447 gross tons. These figures include ships of twenty or more tons. Seven hundred and fifty of these vessels are over 1000 tons, aggregating 2,553,542 tons, while 114 ships of between 5000 and 8000 tons aggregate 648,902 tons." (More recent figures compiled by the Japanese Department of Communi-

have been abolished from June 1. As summarized by the authorities, the regulations drafted under the law exempt the following: Iron and steel materials; new inventions; special articles for fitting up vessels which it is difficult to manufacture in Japan and parts of such articles; engines and parts of engines; all to be used for the construction or repairing of iron and steel vessels.

Yokohama Dock Dividend

The Yokohama Dock Company's dividend for the last six months is at the rate of 15 per cent a year. Net profits were yen 1,033,192, to which is to be added yen 293,528 carried forward from the preceding term. Disposition was made as follows: legal reserve, yen 55,000; special reserve, yen 100,000; workmen's relief fund, yen 25,000; bonuses, yen 100,000; dividends, yen 750,000; leaving yen 296,721 to be carried forward. The capitalization is yen 10,000,000, divided into 100,000 shares, of which 68,250 are owned by the Nippon Yusen Kaisha.

Uchida Yard Sold

After considerable rumor had been set winging regarding the Uchida yard of Yokohama, the destiny of the plant has been settled definitely by the announcement that the Osaka Iron Works had taken over the equipment and a contract with the Japanese Navy for the construction of a special-service vessel, the last work on hand in the yard. The Uchida plant, which was described under the title of "Japan's Oldest Engine Works" in the October, 1919, issue of Pacific Marine Review, was founded in the '70's and was known for years as the Yokohama Engine & Iron Works. Nobuya Uchida, president of the Uchida Kisen Kaisha, bought the plant in April, 1917, capitalizing it at yen 3,000,000, paid up, and lending it yen 1,500,000. During the war the yard prospered, building several vessels, among which were the Eastern Glade and Eastern Glen for the Shipping Board; but up to the present business term it is reported to have incurred a large debt. More than 1200 workmen were discharged June 20, the last day of the Uchida yard. It will be known hereafter as the Yokohama Iron Works.

Reports from Japan say that a strike of employees of the Osaka Iron Works has been settled by the company recognizing the union. This may be regarded as quite important, because employers of Japan have been extremely loath to recognize

any unions except those sponsored by themselves. The Fujinagata yard strike still continued in late June.

Russian Ships and Docks

According to a statement appearing in a recent number of the Soviet journal, *Pravda*, a translation of which was forwarded by Trade Commissioner H. Lawrence Groves of Riga, Latvia, May 26, the number of commercial steamships of all kinds in possession of the Soviet Russian government on March 1, 1921, was as follows: in Baltic Sea ports, 78; in the Caspian Sea, 238; in the White Sea, 329; in the Black Sea, 222; on the Caucasian coast, 58; in Crimean ports, 69; in the Sea of Azov, 62; total, 1056. The article further states that the Soviet government possesses 946 sailing vessels, of which five are in the Baltic.

Of 732 steam vessels in use at present, only 566 are in fit condition. Owing to lack of materials and facilities, as well as fuel, Soviet docks are unable to handle the situation, and the government is therefore greatly interested in contracting for repair work in different ports, especially those of the Baltic Sea—Reval, Riga, Libau, Copenhagen and Kiel.

From an official Soviet source it is learned that as late as May 14 steamships lying in the ports of the Black Sea were in an especially poor condition, almost all their engines being completely destroyed.

In a report of May 5 to the Soviet Institution for Economic Research (a translation of which was forwarded May 9 by W. S. Howell, secretary to the American Legation at Prague, Czechoslovakia), Professor Rafalovich states that the Soviet government has a total of 98 ships for coast traffic, and that the industry shows a general decrease in skilled workmen, lack of laborers, and lessened efficiency.

In anticipation of trade following the commercial agreement with Great Britain, the Soviet government has been making efforts to put a few ports into condition for entrance of foreign shipping.

On May 1, Golos Rossii (Berlin) reported the situation not up to expectation. The port of Petrograd was in very bad condition, with mechanical equipment not working, the technical personnel lacking and auxiliary vessels disappeared. Mine sweeping, according to *Krasnaya Gazeta*, was not expected to begin until May 15. By May 31, according to *Latest News* (Paris), only one steamer had sailed from the port.

In the Black Sea port of Odessa, the elevated "estokada" for car-ship loading was taken down by the Bolsheviks and used for fuel. Early in the year the Soviet government declared Nikolaev and Novorossiisk to be first and second ports, respectively, for entrance of foreign vessels.

With Far East Operators

N. Y. K. Report

"The net profits of the company for the last business term amounted to yen 5,540,000, showing a decrease of yen 3,840,000 compared with the previous term and of no less than yen 11,450,000 in comparison with the net profits of the corresponding period of last year," said Yonejiro Ito, president of the Nippon Yusen Kaisha, in addressing the stockholders at the annual meeting in Tokyo May 30. "About 1914 it was generally recognized that there was a suitable balance between tonnage and cargo. At that time the world's freight space amounted to 45,000,000 tons, while the amount of sea-borne cargo, according to our investigations, was about 330,000,000 tons. The world's shipbuilding capacity was 3,000,000 tons a year. The prices of ships were yen 100 per ton. Wages were 35 shillings in England, and bunker coal at Port Said was available at 26s. 6d. The freight rate on coal from Moji to

Yokohama, a standard for coasting freight rates in Japan, stood at 60 sen per ton, while the Port Said-Cardiff coal freight, the barometer of the freight market in the West, was quoted at only 7s.

33 Per Cent Cargo Reduction

"Owing to the effects and dangers of war, the world's tonnage available decreased to 25,000,000 tons. . . . While the world's total tonnage has since increased to about 60,000,000 tons, there has been a marked decline in movements of cargo. . . . Last year's movements of cargo in the world amounted to 220,000,000 tons. This shows an increase of 100 per cent in value over the figure for the normal year, but it shows a decrease of 33 per cent in quantity.

"In Japan there were 3,100,000 tons of vessels at the end of last year, showing an increase of 1,400,000 tons, or 83 per cent, compared with the figure before the war. Last year's foreign trade of Japan

amounted to 13,400,000 tons, which shows an increase over the pre-war figure of only 2,000,000 tons, or 18 per cent. The excess of tonnage works out at 37 per cent, and this fact should be carefully noted by all shipping men.

Half Shipping Needed

"While the world's tonnage shows an increase of 33 per cent over the pre-war figure, movements of cargo show a decrease of the same percentage, and the ratio of the excess of freight space works out at 50 per cent. The present total tonnage of the world being 60,000,000, the actual tonnage required is only 30,000,000 tons.

"In these circumstances, it is but natural that the shipping situation should be depressed with a great decline in freight rates. The present rate from Moji to Yokohama is yen 1.90, while the Cardiff-Port Said rate stands at 16s. 6d. The price of ships is only yen 150 or yen 160 per ton, but the price of coal is still quite high, being 82s. 6d., and British wages are 61s. 6d. Prices of all commodities are still about three times the normal figures. Owing to the depression of trade, increased expenses, and the excess of tonnage, all shipping services are unremunerative at the present moment.

"About 10,000,000 tons of ships are tied up in various countries, including more than 300,000 tons in Japan."

The company declared a dividend of 25 per cent, as against 30 per cent for the preceding six months.

Subsidies and the O. S. K.

In "Past and Present," a booklet issued by the Osaka Shosen Kaisha in connection with its report for the business term ending December 31, 1920, appear some interesting statistics relating to the company's growth since its formation forty years ago. The O. S. K. takes justifiable pride in detailing the steps of its progress to its present commanding position in the world of shipping, and as an epitome of modern industrial Japan the booklet is well worth a more thorough review than can be given here. One portion, however, calls for the careful attention of the American shipowner and a more thorough analysis than the casual reader is likely to accord.

This section deals with the importance of Japanese government subsidies. In the period 1894-1898, as we read on page 23, subsidies aggregated yen 189,532; they grew to a maximum of yen 2,470,712 in 1914 and fluctuated within relatively narrow limits until they had declined to

Year	Number of steamers	Tonnage	Average tonnage each vessel	Value of steamers	Average value per ton
1909	108	122,446	1,131	14,819,931	121.33
1910	108	135,325	1,253	16,678,282	123.25
1911	108	149,937	1,388	17,400,942	116.11
1912	108	169,081	1,566	18,305,394	108.26
1913	109	176,913	1,632	17,805,749	100.65
1914	109	191,204	1,753	18,575,436	97.15
1915	106	210,346	1,984	22,377,277	106.39
1916	109	213,150	1,950	20,270,014	90.89
1917	117	249,892	2,135	30,104,708	141.53
1918	124	302,439	2,436	34,998,157	115.71
1919	126	341,843	2,634	41,424,213	124.83
1920	133	460,702	3,013	65,657,711	163.86

Growth of the O. S. K. fleet since 1909

Year	Freight	Passage money	Government Navigation Subsidies	Percentage to total revenue			
				Freight	Passage money	Subsidies	Other receipts
1884-88	Yen 353,796	Yen 454,927	Yen —	Per cent 41.8	Per cent 54.0	Per cent —	Per cent 4.2
1889-93	435,488	413,308	—	45.5	43.2	—	11.3
1894-98	851,287	725,958	189,532	36.2	30.9	8.1	24.8
1899-1903	2,440,711	1,414,185	928,259	45.5	26.3	17.3	10.9
1904-08	5,358,251	2,601,499	1,119,333	48.2	23.4	10.1	18.3
1909-13	9,053,623	3,552,742	2,276,746	56.1	22.3	14.0	7.6
1914	11,151,509	3,790,004	2,470,712	57.6	19.6	12.7	10.1
1915	16,846,724	3,594,797	1,700,294	71.4	15.3	7.2	6.1
1916	35,964,361	4,119,276	1,739,479	82.3	9.5	4.0	4.2
1917	62,224,643	4,934,720	1,716,949	85.9	6.8	2.4	4.9
1918	149,019,698	6,522,396	1,687,579	88.0	3.9	1.0	6.3
1919	106,577,981	8,130,189	1,718,317	83.8	6.4	1.4	8.4
1920	70,889,054	10,143,305	1,390,480	79.0	11.3	1.5	8.1

Sources of O. S. K. revenues, 1884-1920

Year	Revenue	Expenditure		Net profit	Rate of dividend Per annum	Increase in the Reserve and the Amount carried forward
		Working Expenditure	Cost of maintenance of steamers			
1914	Yen 19,346,155	Yen 13,770,885	Yen 3,116,000	Yen 2,459,270	Per cent 10.0	Yen 846,850
1915	23,603,626	15,795,874	3,787,000	4,020,752	11.0	2,348,305
1916	43,674,063	23,127,564	9,431,000	15,115,500	24.0	6,240,555
1917	72,457,210	36,342,656	11,075,620	29,039,555	45.0	27,532,712
1918	167,871,440	80,663,627	36,820,000	42,208,812	60.0	21,163,000
1919	127,168,897	82,584,562	21,210,000	20,824,335	40.0	6,332,248
1920	89,716,444	67,243,554	11,420,000	11,052,890	20.0	12,610,970 (decrease)

O. S. K. revenues and expenditures, 1914-1920

yen 1,390,480 in 1920. But to a company of the rapid growth and present size of the O. S. K., any statement of subsidies in terms of yen alone is not completely accurate, and accordingly the company has compiled the percentage of total revenue represented by subsidies for different years. For the four-year period 1894-1898, subsidies, although small in terms of yen, made up no less

than 8.1 per cent of revenues; they rose to 17.3 per cent in 1899-1903; declined to 12.7 in 1914; to 1 per cent in 1918; and rose to 1.4 in 1919 and 1.5 in 1920. It may be seen, therefore, that to the O. S. K., at least, subsidies are comparatively unimportant.

That is true, on the other hand, only so long as the company is able to command a volume of business

commensurate with that of the past. Let us consider subsidies in their relation to capitalization. The paid up capital in 1920 was yen 62,500,000, although the total assets were yen 169,125,149.22. If from the latter be deducted the bookkeeping entry of yen 37,500,000, unpaid capital, the net is yen 131,625,149.22. This is, of course, altogether out of proportion to the capitalization and it explains why such companies as the O. S. K. and N. Y. K. pay dividends apparently enormous but actually modest enough when the assets are considered. However, the fact does remain that the paid up capital is only yen 62,500,000, on which the subsidy of 1920 would suffice to pay a dividend of 2.2 per cent. Well, in times such as these 2.2 per cent is something.

For the last six months of 1920 the O. S. K. dividend was at the rate of 15 per cent a year. For the first six months of 1921, say recent advices from Japan, the rate will be 10 per cent a year, or 5 per cent for the six months. Net profits were yen 5,040,000, as against yen 10,120,000 for the preceding term. Yen 2,000,000 had to be drawn from dividend reserves to make possible the 10 per cent declaration, and the amount carried forward was yen 390,000, quite a decrease from the yen 1,425,000 of December 31.

Australian Coasting

The Osaka Shosen Kaisha and Nippon Yusen Kaisha are adversely affected by the new Australian act closing the coastwise trade to vessels that do not pay Australian wages and maintain similar equipment. The act evidently was aimed at Japanese shipping. The two companies named are said to take the view that the trade is not important enough to justify raising their standards. Rates are reported to be advancing as a result of the law, which became effective July 1.

Liner for N. Y. K.

The marked improvement in trans-Pacific passenger services consequent upon the dispatch of Shipping Board 535's to that ocean, to which attention was drawn last month, still continues. In addition to the purchase of ex-German liners by the Canadian Pacific and the charter of the Taiyo Maru (Cap Finisterre) by the T. K. K., the Nippon Yusen Kaisha is about to build a 15,000 gross ton vessel in the United Kingdom, according to reports current in Japan. The new vessel will be completed by the end of 1922 and probably will be used between Puget

Sound and the Orient. The construction of a vessel of this nature, after the N. Y. K. had abandoned its great building plan and after it had refused to operate the Taiyo Maru for the Japanese government, comes as a surprise. Perhaps Shipping Board competition, as conjectured, has been responsible.

Oil for Japan

The Asiatic Petroleum Company (British) has recently completed a contract, through the Rising Sun Petroleum Company, to furnish the Japanese government with 200,000 tons of fuel oil. When this contract is fulfilled the existing tanks of the Japanese government will be filled to capacity. New tanks, however, are being constructed. The efforts on the part of the Japanese government to buy out the oil interests of some subsidiary companies in the Dutch East Indies were not successful. Also the efforts of the government to develop the oil fields in Saghalien are meeting with little success, not because of the lack of oil, but chiefly on account of the remoteness of the oil fields and the severity of the climate which permits operations during not more than three months of each year.

Flock to Atlantic

Data compiled by the Department of Communications of Japan indicate that Japanese vessels flocked to the Atlantic Coast immediately after the American marine strike began May 1. At the end of May tonnage engaged in the North Atlantic-Far East service was 212,889, an increase of 66,305 as compared with April tonnage. Other changes from April were: Vladivostok, increase of 28,000 tons; North China, increase of 52,000; East Coast of South America, increase of 15,351; Straits, decrease of 38,000; Europe, decrease of 66,000; In addition to a few minor changes.

Amalgamation Again

More amalgamation talk is in the air, although it is relatively subdued and does not deal with millions of deadweight tons. The latest gossip is that the Taiyo Kaifu Kaisha (Ocean Transport Company) will take over vessels of the Nippon Kisen Kaisha and the Osaka Iron Works, and that an individual connected with the Osaka Iron Works will help out the Uchida Kisen Kaisha and that the Osaka Shosen Kaisha, which is closely connected with the Osaka Iron Works, will take over the Uchida shipyard.

New Chinese Line

Reports from Shanghai say that the Peking government has approved a \$4,000,000 all-Chinese steamship company, which will operate a passenger and freight service between Hongkong and Chile via Shanghai, Honolulu, Mexico, Panama and Peru and between Hongkong and New York via Shanghai, Honolulu, Panama and Cuba. It is reported that the Hwah-ping, ex-German, has been chartered. The new company is known as the China Steamship Company.

Insurance Firms May Unite

Depression of foreign trade and competition among themselves have made difficult the position of marine insurance companies in this country, and there is talk of amalgamation as a means of tiding over the difficulty, says the Japan Advertiser of Tokyo. At present there are twenty-nine marine insurance companies here. Of these, thirteen are engaged exclusively in marine insurance, eight carry on marine in addition to fire and other insurance, and another eight are marine re-insurance concerns. . . .

The Japan-London rate for general cargo was yen 3 per yen 100 during the height of the war boom, but the present premium is only yen 0.50, or just the same as before the war. In some other cases the present rates show a decline of between 10 and 20 per cent as compared with the pre-war quotations. The standard rates from Japan now charged are 22 sen for Shanghai; 25 sen for Dairen or Tsingtao; 30 sen for Tientsin, Hankow, Yinkow, Hongkong, or Canton; 45 sen for Vladivostok; 30 sen for Singapore, Cuba or Manila; 35 sen for Calcutta or Bombay; 50 sen for Antwerp, Hamburg or Havre; 40 sen for Marseilles; 50 sen for Cape of Good Hope; 50 sen for Melbourne; 30 sen for Seattle or San Francisco; 40 sen for New York (direct), 50 sen (via Panama).

As the seaworthiness of vessels built during the war is generally worse than others, insurance premiums should be higher, but just the reverse is the case. The rates charged are even lower than before the war. Thus before the war the rate for a round-the-world vessel was yen 4.50, but the present quotation is yen 3.50, or a decline of 20 per cent. Premiums for ships in the coasting and the near-sea trade vary, but on the whole the present rates show a decline of 10 to 20 per cent on those of a year ago and of 30 or 40 per cent compared with the rates during the war.



FULL SPEED AHEAD

Steamship Operations

The Marine Strike

To Pacific Coast shipowners the strike situation was increasingly satisfactory during July. Offshore vessels were operated without difficulty, although coastwise steam schooners were not run to any great extent until about the middle of the month, when negotiations with the sailors fell flat and the owners decided to go ahead. Signs of a split in the Marine Engineers' Beneficial Association multiplied; separate organizations were being formed in San Francisco and New York, but whether the movement would take the form of a national organization was not clear.

The chief interest of the month centered upon the steam schooners, the owners of which are represented by the Shipowners' Association of the Pacific Coast. That organization drafted a set of working rules for submission to the sailors. The more conservative leaders accepted the rules and submitted them to the men, who rejected them at the instance of the radicals, whereupon the association began a more vigorous attempt to operate. In these negotiations the association stood firmly upon the wage reductions of May 1 and against signing of an agreement, but it did wish to come to an informal understanding with the sailors, who are much more important in the coastwise lumber trade than in offshore business. One point at which the unions balked was the open-shop provision of the rules.

Immediately after the sailors had declined to accept working conditions outlined by the Shipowners' Association of the Pacific Coast, San Francisco local of the marine engineers decided to return to work, so that the steam schooners found conditions altogether favorable. An employment office was opened at 41 Drumm street, San Francisco, at which both the shipowners and Pacific American Steamship Association hired men; and plans were under way for extending the service to Los Angeles, the Columbia River and Puget Sound. A condition laid down

by the Shipowners' Association was that all members of the Marine Engineers' Beneficial Association and the Masters, Mates and Pilots must resign, as a result of which numerous resignations were received. All in all, indications were that the idle steam schooners, of which there had been about 125, would be returned to duty as rapidly as needed.

Although the American Steamship Owners' Association, representing in this case the Atlantic owners, moved to reduce salaries of deck officers August 1, when the agreement with the unions expired, nothing of the sort was necessary on the Pacific, inasmuch as the old agreement had been abrogated on thirty days' notice and wages reduced May 1.

The Pacific-American Steamship Association is interested in the resumption of the training service of the Shipping Board, which was in good trim a year ago when the steamship Hollywood was accepting cadets, but which has gone to pieces since. Captain Irving L. Evans has advised the association that there is no intention of resuming Hollywood training at this time; he offered, however, to submit to the board any reasons that the association might advance as to the desirability of resumption.

Steamship operators have regarded the training given on such vessels as the Hollywood as very valuable in assuring a supply of young men of American birth. Too many "American" seamen today are aliens.

French Line Coming

The Compagnie Generale Transatlantique has decided to open a service between the Pacific Coast of the United States and Europe, according to announcement made by Louis Prudhon, an official of the line, who was in Mexico and on the Pacific Coast in July arranging for representation. R. J. Ringwood, a well-known shipping man of the Pacific, has been appointed Pacific Coast agent, with headquarters in the Merchants Exchange, San Francisco. Sub-agents at the other ports of the Pacific have not been announced.

"To begin with," said M. Prudhon, "we consider that a service of one steamer a month will be sufficient. Our company, of course, has a large fleet at its command and can increase this at any time. Our European ports of call for the present will be Hamburg, Antwerp, Havre and Bordeaux. On the Pacific Coast our steamers will call at the principal Central American and Mexican ports, San Pedro, San Francisco and probably Portland and Puget Sound."

Many Lines Engaged

The decision of the French Line to enter this service is an acknowledgment of the shifting of trade-routes due to the opening of the Panama Canal. If the Atlantic has been placed next door to the Orient, to the detriment of the Pacific Coast, the Pacific, on the other hand, has been placed next door to Europe, to the detriment of the Atlantic; and both developments have injured the business of the American railroads, which formerly transported the manufactured products of the Eastern states to the Pacific for transshipment to the Far East and also took the agricultural products of the West to the Atlantic for loading on European vessels. The foreign lines especially have been quick to see the trend, for services are being maintained by the Holland-America and Royal Mail Steam Packet (joint), Harrison Line, Norway-Pacific, Johnson Line, East Asiatic; by the Societe Generale de Transports Maritimes a Vapeur to the Mediterranean; and by two American lines, the European-Pacific, operated by Williams, Dimond & Company with Shipping Board vessels to the United Kingdom and Continent, and by the Isthmian Line to the United Kingdom.

Lindvig Returns

R. S. Silva, traffic manager of C. Henry Smith, A. O. Lindvig and the General Steamship Corporation in their successive steamship lines to the West Coast of South America, announces that he has become agent for the Lindvig interests, which will again operate between the Pacific Coast and West Coast under the name of the Latin-American Line.

Ports of Mexico and Central Amer-

ica as far as Balboa will be served by the 2750-ton steamships Baja California and Sinaloa. South of Panama will ply the new steamships Romulus, Remus and Regulus, of 7300, 7000 and 6000 deadweight tons. San Francisco will be headquarters, but cargo will be taken at British Columbia ports, Puget Sound, Columbia River and Los Angeles. The Romulus, the first vessel of the line, will arrive at San Francisco about August 25 from Christiania and will be followed by the others at intervals of about thirty days. San Francisco offices will be maintained at 101 Front Street.

"The Lindvig interests," said Mr. Silva, "were a big factor during the war and at a time when cargo space was at a premium our ships gave the exporters of this coast the best service and attention and helped to move a considerable lot of American products to the South American markets, to the entire satisfaction of the shippers here, who at all times were much pleased with the record of the Lindvig ships. We are back again on this coast to stay, and will again give our friends on California Street the best we have. We are not here to engage in a shipping warfare, but to get our share of the present and future business."

Sorrows of Conferences

Hic canit errantem lunam, solique labores.

That passage is suggested as a suitable epitaph for the individual who attempts to chronicle the vicissitudes of ocean freight conferences. It is especially apt at this time because anyone who follows the ins and outs of things is quite likely to perish by the way, and accordingly be in need of a fitting hic jacet.

The California Pacific Westbound Conference is having (as the idle rich of Hawaii are wont to say) its pillikia these days. The China Mail served notice that it would not bind itself to abide by conference rates, as it agreed to do when it withdrew from the organization; and to cap this break on the Pacific the North Atlantic-Far East Conference, which necessarily has a large bearing on trans-Pacific operations, has been eating loco weed. After juggling the Oriental steel rate for several months and managing to keep that tariff in the air as skillfully as a Japanese juggler does a knife, the conference has come out with a cut of \$3, or from \$16 to \$13, and there are not lacking those who assert that steel might be booked for \$12

if there were any shipper so unprincipled as to go in quest of that rate.

Influenced by Wheat Cut

These two troubles of the California Pacific Westbound are closely connected. In the formal letter announcing its action, the China Mail stated that the inability of different conferences and even of members of the same conference to get along smoothly had led the company to decide to abrogate its agreement to uphold rates, so that it might be in a position to look out for itself. But the China Mail also was affected, it appears, by a reduction in the trans-Pacific wheat rate from \$7 to \$6, which was made effective July 6 and of which the company, through a slip, did not hear until the next day. Officials of the China Mail said, however, that they had no intention of initiating general rate-cutting, and in view of this and the fact that the company's vessels are small and do not carry large lots, its independent policy would not be regarded as grave were New York not likely to be influenced.

Speculation About Steel

Trans-Pacific operators clearly see now that the North Atlantic intends to permit no Pittsburgh steel to pass through ports of the Pacific Coast. The ocean rate of \$13 a long ton, or \$11.61 a short ton, practically closes all steel production centers east of Chicago. Something might be done, however, if the railroads would grant an overland rate from Pittsburgh of 71 cents as against 80 in force today (although such a reduction would force Chicago down to 62 because of the 9-cent differential of the I. C. C.). With a 71-cent rate in effect, the transcontinental haul would cost \$14.20 a short ton. Then the trans-Pacific operators could reduce their rate to \$5, this to include the 15-cent state tolls in San Francisco, and have an advantage of just 1 cent over the Atlantic. Whether the railroads would cut the Pittsburgh rate to 71 cents appears doubtful. And if that were done, the Atlantic easily might counter with a cut of another dollar, which would force the trans-Pacific rate to \$4, or approximately the actual cost of handling a ton of steel. All this brings home the fact that in times such as these the transcontinental or intercoastal rate is too large to leave the trans-Pacific lines sufficient margin.

Seattle Having Difficulty

The North Atlantic-Far East Conference is taking a leaf out of Seattle's book and is preparing to post

bonds guaranteeing the upholding of rates by the different member-companies. San Francisco rejected the suggestion several weeks ago. At the time this is written, Seattle appears to be having much difficulty in organizing, or rather in reorganizing, its conference, although no rate-cutting has been reported.

At a meeting July 8 the California Pacific Westbound Conference reduced the potato rate from \$12 to \$10, weight; rice from \$9 to \$7, weight; petroleum products from \$8 to \$6, weight or measurement; and flour from \$7 to \$6, weight. That last reduction brought a cut in wheat from \$7 to \$6; and the petroleum reduction was in conformity with one of \$2, from \$8 to \$6, made July 2 on gasoline, which equalizes the Pacific and Gulf.

Tea Rate Broken

Pacific eastbound rates are holding no better than westbound. Advances from Japan say that the conference tea rate has broken from \$8 to \$6, the latter figure being \$4 less than the 1920 tariff. Shipments of tea were dispatched in vessels of the O. S. K. and N. Y. K. in June at \$8, which at that time was the conference rate; but the Mitsui Bussan Kaisha, a disturbing factor in the Northwestern United States last year, entered the market and collected cargo at Shidzuoka, offering to ship from Yokohama at \$4. In view of Shimidzu-Yokohama costs of \$1.50, the total rate to the Pacific Coast was only \$5.50. To meet this the conference has cut its Shimidzu tariff to \$6, but even this is 50 cents more than the Mitsui offer.

Trade Commissioner H. A. Butts of Tokyo reported to the Department of Commerce May 3 that the tea crop of the year will be 25 or 30 per cent below normal due to the American financial depression and resultant restricted market of last year. Japanese exports to the United States last year were 22,791,000 pounds, a decrease of 4,500,000 from those of 1919 and about one-half of the average of several years. Exports of 1921 are estimated at not more than 15,000,000 pounds, a great falling-off, indeed.

Elsewhere in the Far East rates are sagging or are about to break under pressure of shippers. For example, hosiery manufacturers have sought a reduced rate to India, with the result that the N. Y. K. and O. S. K. are represented as having agreed to cut from yen 50 to yen 30, the latter being the cotton goods rate. Match manufacturers say that

they must pay yen 27 to Bombay, whereas Swedish makers pay only half as much, or 27 shillings, both quotations being with a 10 per cent rebate.

Other cuts apparently have had the effect of increasing business to such an extent that increases actually are being made. The Dairen-Europe wheat tariff has moved from 35 shillings to 50, and other tariffs also are firmer. Coasting and near-sea rates of Japan remained practically unchanged during June.

On the Scent of Copper

After a series of highly diverting maneuvers, the Pacific Coast-North Atlantic Eastbound Conference yielded on July 18 to the importunity of the copper producers of Utah and granted a reduction in the rate of that commodity from \$8 to \$6. Arizona recently was granted a railroad rate reduction, in which Utah did not participate, and the miners of the latter state immediately began to besiege the intercoastal steamship lines with requests for a \$2 cut.

Like their predecessors at Troy, they came bearing gifts. First one steamship company and then another was offered a fair bit of tonnage at \$6, and one line even went so far as to demand 3000 tons at \$8 before it would consent to a reduction of \$2. But almost as rapidly as one company saw the light from over Utah, another closed its ears to the jingle of the guinea, until the whole situation bore a close resemblance to the see-saw of childhood.

Some suspicious individuals were inclined to believe that the copper miners merely wished to use the steamship lines as a club with which to smite the railroads; that if a steamship reduction of \$2 were made the miners would be able to go to the transcontinental lines and demand a like cut; and that, if this were given, the intercoastal companies would be roughly comparable to the neophyte snipe-hunter—that is, holding the bag. This suspicion was buttressed by figures that seemed to prove that steamship transportation could not hope to compete with railroads because of the costs of shipping from the Atlantic seaboard to the interior, and because liberal milling and transit privileges were granted by the railroads. But in order for the miners to go to the Interstate Commerce Commission with a request for a lower rate based on steamship tariffs, they would have to show that the water charge actually was in being and not merely on paper, so that ship-

ping men were inclined to believe that a fair copper tonnage would move for a few months.

Whatever the truth, the spectacle, in the midst of a dull theatrical season, was not without its merits.

Australasian Paper

The first vessel of the newly-announced Orient-Pacific Coast-Australia service of the Yamashita Kisen Kaisha will arrive at Pacific Coast ports in August and September, sailing from San Francisco about September 15.

Yamashita and the other companies engaged in Australasian trade are keenly interested in this year's newspaper contract. The newspapers of Australia and New Zealand import about 50,000 tons annually from Canada and heretofore have awarded the contract for transportation to one line, the Canadian-Australasian (Union Steamship Company of New Zealand) holding it for the current year. All cards were placed on the table when the new conference was organized, however, and this fact and the keener competition of such new lines as General Steamship, Canadian Government Merchant Marine and Yamashita, causes operators to look forward to October, when the contract expires.

Opens Portland Office

A. P. Hammond, Pacific Coast manager of the Luckenbach Line, announces the establishment of an office in Portland, Ore., and the appointment of J. G. Euson as agent, with offices in the Railway Exchange building. Mr. Euson formerly was manager for the General Steamship Corporation, which acted as Luckenbach agent at Portland.

A Government Alaska Line

Edwin H. Duff makes the following pertinent comment upon S. 2203 providing for a government steamship line to Alaska:

"As an instance of how much talk of co-ordination exists in the matter of government operation of ships one has but to read the bill . . . introduced on the 5th instant (July) by Senator Cummins. While the administration is calling upon the Shipping Board to get the government out of shipping, and the House committee on merchant marine and fisheries is considering a bill to concentrate Army transport and Panama Railroad Steamship Company's operations under the Shipping Board, a senator, at the instance of a cabinet officer (the secretary of the interior), introduces a measure to start the Interior Department in the ship-

ping business for the purpose of competing with private shipping now engaged in the Alaskan trade. And this provision, it will be noted, is carefully hidden in a bill the title of which would never disclose its existence. And in addition the bill is sent to the committee on territories for consideration."

Panama Tolls Bill

Senator Borah has introduced a bill providing that Panama Canal tonnage shall be determined by rules of the canal and that rates shall be assessed and paid according to such determination. The gist of the bill is this: although the Panama Canal follows its own measurement rules, tolls collected are limited by the net registered tonnage of each individual vessel, so that, while the rate now charged is \$1.20 a net registered ton, the canal may collect tolls based on canal measurements so long as the toll does not exceed \$1.25 a ton of the ship's regular certificate; the canal authorities wish to collect on their own measurement only and thereby increase revenues and at the same time equalize the charges to American and foreign shipping, inasmuch as foreign vessels are measured under rules that frequently give them a decided advantage over American. Vessels of American registry, however, might possibly be charged for deck-loads, the space occupied by which may not be measured into the ship's net if the total should exceed the ship's registered net.

New Services

A new service between Seattle and Hawaiian ports has been opened by the Alaska Steamship Company, which announced that the steamship Cordova would sail from Puget Sound and the Columbia River in July. She will maintain thirty-day sailings. The steamships Valdez and Juneau will be placed in the service should business warrant.

The transports Great Northern and Northern Pacific continue to be discussed for the Hawaiian service, this time for a Los Angeles-Honolulu run. Whether they actually will be bought, reconditioned and employed in that trade is quite doubtful, but the rumors do add to the interest of life in the dog-days.

Grace Service Resumed

W. R. Grace & Company have resumed steamship service between Seattle, San Francisco and Western South American ports as far south as Valparaiso, Chile, with the sailing of the freight and passenger steamer Colusa from Puget Sound

July 8. The Colusa loaded at Grays Harbor, Tacoma and Seattle, before starting for South America via San Francisco. The company operated on this run until war operations interfered.

A record of 12½ days, New York to San Francisco, was recently made by the steamship Silver State, a Shipping Board 535 allotted to the Pacific Steamship Company. She also made a record of 45 hours, San Francisco to Seattle, reducing the record of the liner President by 2 hours and 50 minutes. The Keystone State set a Los Angeles-Seattle record of 70 hours. To these vessels and the Wenatchee, the first of the 535's allotted to the Pacific Steamship Company, will be added the Bay State, now under construction at the yard of the New York Shipbuilding Corporation.

Columbia in Canal Trade

With the Columbia sailing from San Francisco July 20 the Pacific Mail will have two of the three steamers assigned to the San Francisco-Baltimore service on the run. The third steamer, the Ecuador, will join her sister ships in September. Leaving San Francisco the steamers first call at Los Angeles harbor, then at Manzanillo, Mexico; San Jose, Guatemala; La Libertad, Salvador; Corinto, Nicaragua; Balboa and Cristobal in the Canal Zone; Kingston, Jamaica, and Havana, Cuba, arriving at Baltimore in thirty days. Sailing from Baltimore the steamers make the same calls only in reverse order, certain of the steamers, however, omitting Kingston. The voyage is made in twenty-six days.

Vessels in the Panama service of the Pacific Mail hereafter will call at Ensenada, Magdalena, San Jose de Cabo and La Paz in addition to the former ports of call.

An Unusual Affair

The Toyo Kisen Kaisha made good its promise to give "something different" to several hundred invited guests aboard the new liner Taiyo Maru, formerly the Cap Finisterre, July 1. So many new steamships had arrived at ports of the Pacific during the last few months that the management of the Japanese line decided that no ordinary reception and inspection of the vessel would satisfy, and, accordingly, arrangements were made for a cruise outside San Francisco Bay, beginning at 12:30 o'clock.

Luncheon was served to 450 guests at 1:30. With that and a little speech-making ended, the swimming

tank, in which a number of bathing girls were to be seen, was the center of attraction; and thereafter there was dancing and an orchestra concert. Deck golf, a Japanese comedy, Japanese juggling and magic were other features of the entertainment. The vessel berthed again at 6 o'clock. On the voyage out the Taiyo Maru met three dreadnoughts and several cruisers and destroyers of the Pacific fleet.

On the day preceding 16,000 persons had visited the vessel at her dock. She sailed on her first west-bound voyage to the Orient July 2.

The T. K. K. steamship Rakuyo Maru, the first of the new intermediate liners for the Orient-South America service, sailed from Yokohama the first of July for Honolulu, Hilo, San Francisco and West Coast ports. She is of especial interest because she is one of the first Japanese-built vessels to be equipped with geared turbine engines. She was built by the Mitsubishi yard, Nagasaki.

Briefs

The Matson Navigation Company has placed the combination vessel Lurline and the new 14,000-ton freighter Manukai in a triangular service between San Francisco, Puget Sound ports and Honolulu, Port Allen, Kahului and Hilo, and return to San Francisco. The Manukai is the largest vessel yet employed in this trade. During the last few years the demand of Hawaii for Northwestern products, particularly lumber, lumber products, and feed, has grown greatly.

Panama traffic of May was the smallest since June, 1920. Commercial vessels passing through the canal were 210; they carried 792,735 long tons of cargo. In April, 1921, 227 vessels passed through, carrying 907,613 tons; and in May, 1920, the number of vessels was 214 and the cargo 974,919 tons.

The Panama Canal announces that vessels may be supplied with bunker oil without restriction. Oil purchased of the canal itself costs \$2.75 a barrel of 42 gallons, either at Cristobal or Balboa; but private companies, says the Panama Canal Record, are offering fuel at \$2.10. Diesel oil at Balboa is quoted at \$3.50.

The Los Angeles bond issue of \$4,800,000, approved by the voters of the city recently, will be expended as follows: Municipal Pier No. 1, \$1,000,000; west basin development,

\$400,000; fish harbor improvements, \$500,000; belt line railroad, \$300,000; Harbor Boulevard, \$600,000; new sheds, etc., on east side of main channel, \$500,000; ferry and terminals, \$200,000; Terminal Island sea walls, \$200,000; wharves on west side of the main channel, \$800,000; equipment, \$300,000; total, \$4,800,000. The equipment appropriation will be of the greatest general interest to manufacturers. Just what will be purchased has not yet been announced.

The Standard Oil Company of California now has the largest privately-owned American-flag fleet on the Pacific Coast, says the Standard Oil Bulletin. When the three 15,000-ton tankers building by Bethlehem and the 4750-ton motorship building by Moore have been added to the fleet, it will comprise forty-one vessels of a deadweight tonnage of 165,000.

Judge Robert W. Jennings, United States district judge, Juneau, Alaska, has denied the application of the territory and the Juneau Hardware Company for an order restraining the customs from forfeiting merchandise transported in violation of Section 27, Merchant Marine Act, which forbids the diversion of goods to Canadian ports for shipment to Alaska, the intent being to prevent evasion of the coastwise laws. Attorney General John Rustgaard said that he would carry the case to the Supreme Court.

The receivership of the Pacific Motorship Company and the Pacific Freighters Company, both of San Francisco, has been removed by agreement. The Ocean Motorship Company, recently organized, will take over the fleet and assume the obligations of the Pacific Motorship Company.

Puget Sound-California freight rates were reduced, effective July 1, by the Pacific Steamship and San Francisco and Portland lines.

The 285 wooden vessels offered for sale by the Shipping Board, sealed bids to be opened July 30, are as follows: Daugherty type, 9; Ballin, 15; Peninsula, 10; Pacific American Fisheries, 7; Allen, 1; McClelland, 15; Ferris, 180; Hough, 28; Lake & Ocean Navigation, 1; Grays Harbor, 11; Standifer, 1. "Wherever consistent with diplomatic relations" vessels may be transferred to foreign registry.

Shipbuilding

World Construction

According to Lloyd's Register, shipbuilding of the world fell off nearly 900,000 tons from March 31 to June 30, the decline being the sharpest of all three-month periods, since the peak of construction was reached in the fall of 1919. American construction dropped nearly 400,000 tons and British 270,000. Germany did not report. On June 30 the total tonnage building was 6,199,000, of which the United States had 717,000 and the United Kingdom 3,530,000, but the British figures included 736,000 tons of which work had been suspended and 444,000 tons delayed by strikes. The margin of British yards over American on June 30, 1920, was 1,472,000; this almost doubled in the last fiscal year, while work in American yards has declined 66 per cent.

American Figures

The American Bureau of Shipping reports that on July 1 there were 100 ocean-going vessels under construction in American shipyards, the tonnage aggregating 762,854. For private account there were 78 vessels of 567,838 tons for the Shipping Board 22 of 195,016. River and harbor craft numbered 99 of 54,646 tons in addition to those listed above. Seventy-five of the 100 ocean-going vessels were tankers or combination vessels, all oil-burning, and 10 of 25 cargo-carriers were to burn either coal or oil.

Compared with the figures of June 1, a decline of 100,000 tons is noted. Twenty-six American shipyards were engaged on new construction July 1.

On July 1 there were under construction in yards of the Pacific Coast of the United States twenty-three steel merchant vessels of 259,890 deadweight tons, according to statistics compiled by Pacific Marine Review. These figures represent a decline of five vessels of 50,990 deadweight tons from those of June 1, no contracts having been awarded to offset deliveries. Vessels completed in June were: two freighters of 20,900 tons for the United States Shipping Board; one tanker of 10,100 tons for the board; one tanker of 8400 tons for foreign private account. No vessels for private American owners were delivered.

In Canadian yards no deliveries were made, the status of June 1 remaining unchanged.

The following table shows construction of July 1:

American Yards	No. Vessels	Agg'te. D.W.
Freighters, USSB.....	4	44,000
Tankers, USSB.....	5	50,200
Tankers, private.....	7	83,690
Freighters, private.....	2	40,000
Tankers, foreign.....	5	42,000
Totals	23	259,890
Canadian Yards		
Freighters, Gov't.....	4	33,480
Freighters, private.....	1	600
Totals	5	34,080

At the beginning of May, reports the Atlantic Coast Shipbuilders' Association, 163 vessels of 581,631 gross tons, exclusive of government work, were under construction in the country. Fourteen vessels were delivered during that month and one new contract, that awarded the New York Shipbuilding Corporation by the Japanese Navy for a fuel vessel, was executed. New York Shipbuilding Corporation leads the country in volume of work.

2,000,000 Increase in Year

A tonnage increase of more than 131 per cent in documented American merchant shipping since the be-

AMERICAN SHIPBUILDING FOR THE FISCAL YEAR ENDED JUNE 30, 1921.

Ships built in the United States and officially numbered by the Bureau of Navigation, Department of Commerce, during the year ended June 30, 1921, totaled 1,429 of 2,210,221 gross tons, not including 33 vessels, of 66,038 gross tons, built for foreign owners, making a grand total of 1,462 vessels of 2,276,259 gross tons. The details of this construction are as follows:

Kinds.	Atlantic and Gulf.		Pacific.		Great Lakes.		Western Rivers.		Total.	
	Num-ber.	Gross tons.	Num-ber.	Gross tons.	Num-ber.	Gross tons.	Num-ber.	Gross tons.	Num-ber.	Gross tons.
WOOD.										
Sailing.....	82	71,207	7	10,873					89	82,080
Steam.....	28	9,560	17	15,991	15	1,495	11	1,721	71	28,248
Gas.....	276	9,451	13	10,111	53	1,180	63	1,110	581	22,851
Unrigged.....	164	36,615	17	3,772	31	6,323	28	272	247	67,012
Total.....	554	111,093	170	40,727	102	8,998	102	3,112	978	183,421
METAL.										
Sailing.....	1	1,149							1	1,149
Steam.....	4728	1,329,484	88	537,730	22	46,712	8	8,909	351	1,958,833
Gas.....	116	16,706	5	6,064	2	2,000	7	2,181	30	27,091
Unrigged.....	10	77,003			5	2,047	10	833	68	29,887
Total.....	298	1,573,444	96	543,633	30	50,739	25	8,914	431	2,016,500
TOTAL.										
Sailing.....	63	72,356	7	19,873					70	92,229
Steam.....	796	1,329,484	108	551,331	47	58,186	19	7,619	473	1,968,611
Gas.....	312	26,447	13	16,175	55	3,270	70	2,380	470	49,992
Unrigged.....	21	77,640	17	3,772	33	8,370	28	1,107	115	90,900
Grand total.....	802	1,511,537	279	583,508	141	99,925	127	12,125	613	2,210,221

* Includes 2 vessels of 12,271 gross tons built of reinforced concrete.

* Includes 2 vessels of 12,284 gross tons built of reinforced concrete.

* Includes 1 vessel of 1,433 gross tons built of reinforced concrete.

The monthly output during the past fiscal year has been as follows:

Months.	Seagoing.						Non-sea-going.		Grand total.	
	Steel.		Wood.		Total.					
	Num-ber.	Gross tons.	Num-ber.	Gross tons.	Num-ber.	Gross tons.	Num-ber.	Gross tons.	Num-ber.	Gross tons.
1920										
July.....	24	195,711	6	18,998	40	196,639	131	20,600	174	217,239
August.....	44	221,513	6	9,318	50	230,831	120	26,992	170	257,823
September.....	41	225,805	9	12,284	50	238,089	85	23,691	135	261,780
October.....	39	121,301	9	6,631	48	127,932	72	16,010	120	143,942
November.....	36	187,499	11	18,080	47	205,579	72	7,777	119	213,356
December.....	24	125,425	7	10,729	31	136,154	56	11,140	87	147,293
1921										
January.....	470	1,093,482	8	10,653	38	207,117	36	9,163	91	236,260
February.....	18	108,173	1	2,190	19	110,363	26	11,035	45	121,404
March.....	21	143,711	4	5,382	25	149,093	59	9,195	84	158,288
April.....	35	111,862	2	2,516	37	114,378	91	7,696	90	122,074
May.....	15	115,412	4	4,217	19	119,539	97	15,021	116	134,560
June.....	22	144,245	9	18,796	31	163,041	129	18,594	160	181,635
Total.....	371	1,988,115	77	113,272	420	2,101,387	1,042	174,772	1,462	2,276,259

* Includes 1 concrete vessel of 6,144 gross tons.

* Includes 1 concrete vessel of 6,144 gross tons.

* Includes 1 concrete vessel of 6,144 gross tons.

* Includes 2 concrete vessels of 7,562 gross tons.

ginning of the war is shown by an official statement of the bureau of navigation of the Department of Commerce.

The total documented American merchant shipping at the close of the fiscal year on June 30, 1921, was 28,500 vessels of 18,350,000 gross tons, as compared with 28,183 vessels of 16,324,024 gross tons in 1920 and 26,943 vessels of 7,928,688 gross tons in 1914. Final returns from collectors of customs not due for several weeks probably will not alter the 1921 total more than 35,000 tons, involving only small vessels.

Sea-going vessels of 500 gross tons or over numbered 3723 of 13,234,401 gross tons, of which 238 of 1,271,079 gross tons are ocean passenger steamers. The United States Shipping Board owns 1798 ships of 7,993,771 gross tons. The Great Lakes tonnage aggregates 2850 vessels of 2,625,000 gross tons, and the remainder consists of sea-going vessels under 500 tons, river steamers, and smaller miscellaneous craft.

Vessels of 500 tons or over registered for foreign trade numbered 2559 of 10,620,717 gross tons, of which 2272 were steamers aggregating 10,244,746 gross tons.

The total increase in the American merchant marine during the year was a trifle over 2,020,000 gross tons, of which 1,090,643 gross tons were Shipping Board ships.

For comparison the tonnage of ships of 100 gross tons or over of the United Kingdom on June 30, 1920, aggregated 8561 of 18,330,424 gross tons, according to Lloyd's Register; the totals for June, 1921, are not yet available.

Some New Work

Although new contracts are scarce some have been reported. The Bath Iron Works has a contract for five lightships, and the Atlantic Refining Company has ordered a small 2000-ton tanker of Bethlehem. The latter vessel will be built at Sparrows Point. The Red D Line received bids up to July 15 for two 14-knot combination vessels of about 4300 tons deadweight capacity and accommodations for 190 passengers. Theodore Ferris designed the vessels. They will be oil-burners, geared-turbine drive. At the time this is written no announcement of the awarding of the contract has been made.

Refrigerator Vessels

The Clyde-Mallory Line is reported to have started plans for the construction of a coastwise steamer for the Florida service. The bulletin of

the Atlantic Coast Shipbuilders' Association thus outlines other work in prospect:

"It is reported that the United Fruit Company is seriously considering the construction of four fruit steamers in American shipyards. It is interesting to note that nearly all of the company's ships heretofore have been built in British shipyards, but it is understood that the United Fruit Company recently cancelled a contract for four ships abroad. One of the factors in the decision of the United Fruit to build in American yards is the exemption of excess profits taxes as provided for in the Merchant Marine Act of 1920. Good news also comes from abroad in the case of the Compagnie Generale Transatlantique, the Swedish-American Line, and other Scandinavian companies, which are understood to have given assurance to American shipbuilding companies that they desire to have them figure upon the next passenger liners projected by them. The speed with which the leading American plants can complete and deliver tonnage is one of the factors which have led the foreign lines to seek estimates from American yards.

"According to listings of April, 1921, the United States has only eighteen straight refrigerator ships, with a total of 3,500,000 cubic feet of storage capacity. Most of this tonnage consists of refrigerator ships ordered by the government during the war. While this amount of refrigerator space is entirely disproportionate to the greatly increased tonnage of the United States, there are in addition to these vessels a number of ships engaged in the transportation of fruit, of which the outstanding example is the Great White Fleet of the United Fruit Company, whose refrigerator spaces aggregate about 5,000,000 cubic feet. Practically all of these fruit vessels were built in England. It is gratifying to note an awakening interest in this type of tonnage."

Matson Plans

Reports that the Matson Navigation Company was making inquiries for two fast combination vessels for the San Francisco-Hawaii service, although founded on fact, are misleading. An official of the line said that he recently discussed construction of two such vessels with representatives of a shipbuilding company, but only in a general manner, and that the Matson Line "certainly had no intention" of building them

at this time. Execution of the plan is for the more remote future.

The Matson Line has just received from the Moore Shipbuilding Company two 14,000-ton freighters, Manulani and Manukai, and began the operation of two Shipping Board combination 535's a few months ago. Although the latter are in the Baltimore-Pacific Coast-Hawaii service, and therefore do not make so many sailings as the company's own liners, they do increase the passenger accommodations to and from Honolulu to a material degree. In view of such additions to the fleet and the depression in sugar, the present would appear an unlikely time for the placing of contracts for two large steamships.

U. S. S. B. Deliveries

Six steel vessels were delivered to the Shipping Board in June, one of which, the motorship William Penn, was the last of all requisitioned vessels. She was built by Pusey & Jones and the Cramp yard installed a Diesel engine purchased abroad by Mr. Hurley. With her delivery both yards completed their board work. Including vessels still to be delivered, the Shipping Board's fleet totals 11,602,416 deadweight tons.

San Francisco Wage Cut

A long-expected wage-reduction in metal trades industries of the San Francisco Bay district was announced by the California Metal Trades Association July 14, effective August 1. Although the Atlantic Coast and the Northwest Pacific Coast announced reductions several months ago, the San Francisco district had remained on the old wage-scale. The new scale will be approximately that of the Atlantic.

Statement of Association

The following statement was issued by the California Metal Trades Association:

On and after August 1, 1921, the basic and hiring wage-scale paid in the San Francisco Bay district by members of the California Metal Trades Association will be in general the same as that paid by the Atlantic Coast shipyards, which is about 10 per cent lower than the basic scale adopted by this association November 24, 1919.

In reducing the basic wage scale we are taking the step that the Atlantic Coast shipyards took last April.

This wage reduction has been postponed as long as possible. It is now an absolute necessity on account of the keen and growing outside competition which must be overcome before there can be any general industrial activity in this district.

Great manufacturing plants established throughout the country during the war are fighting now to maintain themselves permanently. Their principal weapon is low production costs. They are seeking business wherever it offers and wherever it can be developed. Their agents make aggressive efforts to secure every substantial contract. This active competition, aided by the fact that the San Francisco Bay district metal trades industry which has to pay transcontinental freight on most of its raw material, is paying the highest wages in the country, has practically barred this district from participation in the activity derived from new business.

This competitive condition exists in all lines. It is just as active in the field of ship repairs as in the manufacture of metal trade products.

To secure outside business which once was regarded as ours if we wanted it, we must now meet and overcome with lower bids the active competition of northern and southern neighbors and eastern and foreign rivals—all of them paying lower wages than we do. The same competitors have invaded the San Francisco Bay district and jobs that were ours geographically are being done by the workers of other districts because they have gone ahead of us in the march back to lower costs.

The employers of this district have investigated this competition. They have made careful studies of the social, economic and climatic conditions prevailing in other centers. They find that while our natural advantages—climate and better living conditions—are offset in an industrial way by our distance from raw material and other essential supplies and equipment, they believe we are still in a position to get for the San Francisco Bay district enough work to make this the great industrial center it should be if we keep down our costs of production.

The only way we can keep payrolls alive and growing is to get new business.

The only way we can get new business is to meet our competitors' figures and give better service.

A supplementary notice to employees of 115 shops was issued as follows:

Effective August 1, 1921, the basic and hiring rate in this plant will be that given below. This wage reduction has been postponed as long as possible. It is now an absolute necessity on account of the keen and growing outside competition which must be overcome before there can be any general industrial activity in this district.

The new rates conform in general to those of competing districts, including the Atlantic Coast Ship

builders' scale (which became effective April 1, 1921).

Classification and wages: acetylene burners, 68 cents; angle and frame setters, 72 cents; anglesmiths, 72 cents; apprentices, — cents; bending rollers, 72 cents; blacksmiths, 72 cents; boat builders, 78 cents; boilermakers, 72 cents; boltmakers (bolt and rivet headers), 72 cents; calkers (wood), 78 cents; carpenters, ship, 78 cents; chippers and calkers, 72 cents; coppermiths, 78 cents; countersinkers, 58 cents; cupola tenders (melters), 72 cents; dockmen, 56 cents; drillers, pneumatic, 62 cents; electrical workers, 72 cents; firemen, 52 cents; flange turners (shop), 78 cents; foundry carpenters, 62 cents; heat, frost and asbestos workers, 72 cents; heaters (rivet), 42 cents; helpers, 48 cents; holders-on, 58 cents; joiners, ship, 78 cents; laborers, 42 cents; machinists, 72 cents; mangle rollers, 58 cents; millmen, 78 cents; molders, 72 cents; operators of aerial hoists, single and double cable ways, hoisting donkeys and winches, hoisting cranes and derricks, carrying capacity over three tons, 68 cents; painters, 66 cents; painters, bituminous, 72 cents; passer boys (rivet), 32 cents; patternmakers, 85 cents; pipefitters, 72 cents; planermen, 58 cents; plate hangers, 64 cents; pressmen, 72 cents; punch and shear men, 58 cents; riggers, ship, 72 cents; riggers, yard, 62 cents; riveters, 72 cents; rivet testers, 72 cents; scarfers, 58 cents; sheet metal workers, 78 cents; shipfitters, 72 cents; shipwrights (ship carpenters), 78 cents; specialists, 56 cents; welders, 72 cents.

The following supplementary statement was issued by F. C. Metcalf, commissioner of the California Metal Trades Association, July 15:

The decision to reduce wages, even slightly, was taken by the members of the California Metal Trades Association only after general reductions and reorganizations in other districts were found to leave them still handicapped by prohibitive costs of production in their effort to secure new business for this district.

For more than two years they have considered and tried out plans to meet the steadily growing competition without reducing wages. The increased production, absence of strife and development of a spirit of co-operation, which followed the adoption of the American plan nearly two years ago, were the principal factors in enabling employers in the shipbuilding and metal industries of this district to postpone wage reductions until long after they had been put into effect elsewhere.

Until now we have been paying wages on a scale that was fixed to meet the high war-time living costs. Those costs have decreased and the consequent increased buying power

of the dollar is considerably greater than the announced reduction in wages. If this district would benefit by the industrial revival that must come soon, local production costs will have to be cut to a minimum. Wages must stand their share of the pruning if the present efforts to keep local industrial payrolls alive are to bear any fruit at all.

Atlanta Reduction

Preliminary to another wage reduction, which several Atlantic Coast shipyards are agreed is essential in the immediate future if we are to keep the shipbuilding industry in its proper relation to other industries in the transition from war-time to normal conditions, a complete reclassification of rates and crafts will be established August 1, 1921, in shipyards signatory to the agreement with the metal trades department, the Atlantic Coast Shipbuilders' Association announces.

The pending reclassification should not be confused with the further wage reduction, which is expected to be made shortly after the new schedule becomes effective. The changes planned for August 1 are for the purpose of establishing a more equitable relationship between the compensation paid various kinds of mechanics with due regard to the skill and ability required in each craft.

Macy Increase Dropped

The Los Angeles Shipbuilding & Drydock Company has been directed by the Shipping Board to disregard the wage increase of August 1, 1918, and to revert therefore to the wage scale effective when its contract with the Shipping Board was signed July 10, 1918. Under date of May 9, 1921, Admiral Benson had issued a general order, following upon the board's resolution of January 17, advising shipyards that they would not be required to observe the wage scales and working conditions of the Macy award, but that they might change both to meet general conditions. No action was taken by the company under this letter, and the board accordingly stated that no consideration would be given to claims for wage reimbursements on work done after July 1, 1921. Formerly the government had paid the difference between the old scale and the Macy award.

The Federal Trade Commission has cited the Kelly Dry Dock & Shipbuilding Company, Mobile, in complaint of unfair competition in the ship-repair and drydocking business. Cash commissions, the complaint alleges, are given by this concern to the ship officers without the knowledge of the owners.

News of Eastern Yards

American Bridge

Six coal barges built by the American Bridge Company, Pittsburgh, for the War Department, have been delivered. Two of twenty-five coal barges for the Carnegie Steel were launched in June, the total launched being brought up to fourteen. Keels of three car-floats were laid in the same month.

Baltimore

The 10,250-ton tanker *Lio*, built by the Baltimore Drydocks & Shipbuilding Company for the Shipping Board, was delivered July 15. This was the last Shipping Board vessel under construction at the yard. S. O. Co. No. 7, a barge for the Standard Oil of New Jersey, was delivered July 15, and the keel of the firefloat *Torrent* for the City of Baltimore was laid the same day.

Anchor

A double-ended ferry for the Hudson & Athens Ferry Company was delivered in July by the Anchor Shipbuilding Company, Hudson, Wisconsin. She was the last vessel under construction in the yard.

Bath

Contracts have recently been signed with the government by the Bath Iron Works for the construction of five lightships. Material is expected to arrive at the plant for the building operations some time in the early fall. It is reported that all work now in hand will be completed by August 1, when the yard will shut down for a brief period.

Bethlehem

A contract has been awarded for the construction of a 2000-ton tanker for the Atlantic Refining Company by the Bethlehem Shipbuilding Corporation and preparations have been made for the laying down of the keel at the Sparrows Point plant. The tanker has been specially designed to serve shallow-water ports.

The car-building section of the Harlan plant will soon be in operation, as the company expects soon to begin construction work on a number of steel cars.

The Fore River plant delivered the 12,620-ton tanker *Agwibay* to the Atlantic-Gulf & West Indies June 25; and launched the 10,600-ton tanker *William Boyce Thompson* for Sinclair in July.

Canadian Vickers

The 6400-ton tanker *Topdalsfjord* was to be delivered to the Norwegian-American Line by Canadian

Vickers in July, following her sister *Idefjord*, which was completed in June. These were the last new vessels under construction.

Chickasaw

The Chickasaw Shipbuilding & Car Company, Mobile, completed its first repair job recently on the *Steel Trader* of the Isthmian Line. The ship's machinery was overhauled and other inside work done. Other ships operated by the Isthmian Line, which is a subsidiary of the United States Steel Corporation, as is the Chickasaw yard, are expected to come here in future for repairs which do not require dry docking.

Consolidated

The second 160-foot lighthouse tender, building for the lighthouse bureau, was launched at the yards of the Consolidated Shipbuilding Corporation, Morris Heights, New York City, June 28, and was christened *Hawthorn*.

Cramp

The motorship *William Penn*, built by Pusey & Jones, but engined at the Cramp yard, was delivered to the Shipping Board June 25. She has been allocated to the United American Lines and will sail to the Dutch East Indies via Suez on her maiden voyage.

The efficiency of the workers at the Cramp yard is now fully 30 per cent greater than it was before the strike, according to a press statement credited to J. H. Mull, president of the company. Some of the men who left the employ of the company were well up in years, and not a few would soon have been eligible for pensions had they remained at work. They have been replaced by younger men, many of them war veterans. As a result, the average age of employes has been reduced from 55 to 35 years. About 5400 employes are now on the payroll.

Estimated launching dates of five scout-cruisers under construction at the Cramp yard are as follows: Richmond, Navy No. 9, Cramp hull 448, August 15; Concord, Navy No. 10, Cramp hull 449, October 1; Trenton, Navy No. 11, Cramp hull 501, November 1; Marblehead, Navy No. 12, Cramp hull 502, December 1; Memphis, Navy No. 13, Cramp hull 503, February 1. These vessels are of the same class as three building at the Todd yard, Tacoma, being listed as light cruisers, first line. Ten are under construction, the remaining two being at the Fore River yard, Bethlehem.

Davie

An 8350-ton freighter for the Canadian Government Merchant Marine, christened *Canadian Challenger*, was launched by the Davie Shipbuilding & Repairing Company on July 7.

Federal

The new 9000-ton floating drydock that has just been completed by the Federal Shipbuilding Corporation at Kearny, New Jersey, was put into commission June 25, when one of the 5350 deadweight ton cargo-carriers of the Submarine Boat type was lifted. The dock measures 446 feet over-all. Dredging was started in November, 1920, and work on the pontoons was begun January 3, 1921. The dock was completed and ready for operation June 15. It has steel wing walls, with wooden pontoons. There are eighteen centrifugal pumps operated by eighteen 30-horsepower motors. The pumps are located at the outside end of each pontoon directly under the wing walls. The dock will be able to accommodate ships up to 460 feet in length. William T. Donnelly was designer.

The Federal yard launched the 15,000-ton tanker *J. A. Moffett Jr.* for the Standard Oil of New Jersey July 14.

Globe

Globe of Maryland launched the Eagle oil tanker *San Leopoldo*, 8600 tons deadweight, and the sister *San Leonardo* July 8. Both are scheduled for August delivery. They are the last vessels under construction at the yard.

Hog Island

It is reported that Ellis A. Gimbel, representing a number of wealthy Philadelphia business men, is negotiating with the government for the purchase of the Hog Island shipyard, with the intention of converting it into a mammoth terminal similar to the Bush Terminal in New York. At a recent dinner Frank A. Zeller, a terminal engineer, said that plans for the erection of terminal piers and warehouses on the site of Hog Island had already been approved by leading engineers of the United States and Europe. They provide, he says, for close co-operation between ship and railroad lines, and would make Hog Island of inestimable value to Philadelphia and the country as a whole.

Johnson

Maurice P. Davidson and Frank E. Stripe have been appointed receivers in equity for the Johnson Shipyards Corporation, Port Rich-

mond. It is stated that the liabilities are about \$175,000 with assets of \$750,000. Numerous suits are said to be pending against the corporation and, owing to shortage of liquid assets, it is said that a receivership is necessary to conserve the property. The company is incorporated at \$100,000, of which \$80,000 is preferred stock.

Lake Torpedo

The submarine S-50, U. S. N., was launched by the Lake Torpedo Boat Company, Bridgeport, June 18, following her sisters S-48 and S-49, which were launched in February and April. The S-51 remains on the ways.

Merchant

The activity of the Merchant Shipbuilding Corporation in the general engineering field is evidenced again by the consummation of two contracts running into large sums of money. One contract calls for the construction of two structural steel radio towers at Annapolis and for the remodeling of four existing towers. The towers contemplated are 600 feet in height. The other contract provides for the construction of sixteen movable steel platforms for the construction firm of Snare & Triest of New York. The latter firm is at present building some docks at Stapleton, Staten Island, and it is in connection with this work that the platforms are needed. The Merchant Shipbuilding Corporation has filed bids for some fifty-five different kinds of construction work.

Murnan

Two barges, built of wood, each having a capacity of 7500 barrels of oil, were recently completed for the Mexican Oil Company by the Murnan Shipbuilding Company of Mobile. This delivery completes a contract for twelve.

Nashville

Considerable activity in shipbuilding of small tonnage is indicated in recent reports received from the Nashville Bridge Company, Nashville. This company has delivered a derrick boat to New Orleans for the government and has launched a 600-ton barge, and three others were to be launched soon. The company also was completing equipment of a steel twin-screw tug. During the war the Nashville Bridge Company built a number of 1800-ton oil barges for delivery at New Orleans. The company has a plant well-equipped for barge construction, with space for four barges at a time and can move to tide water boats as large as

260 by 50 by 8 feet draft. The plant also has the distinction of holding the record for riveting in the Southern district during the war.

National

The plant of the National Shipbuilding Company of Goderich, Ontario, which was recently destroyed by fire, will be rebuilt at a cost of \$100,000. New equipment will be installed.

Navy Yard, Boston

The Boston Navy Yard expects to deliver the fuel ship Pecos to the United States Navy in August instead of October as previously estimated.

Newport News

The superdreadnought Maryland put to sea June 21 from Newport News for a series of tests preliminary to being turned over to the Navy Department. The Maryland, as soon as commissioned, will be transferred to the West Coast as one of the units of the reorganized Pacific fleet, to which force also will be assigned, on completion, her sister ship, the California. Carrying eight 16-inch rifles in four turrets, the Maryland is said to combine the longest range with the heaviest broadside of any naval vessel afloat. She is electrically equipped. In addition to the two electric drive dreadnoughts, the reorganized Pacific fleet as announced by Secretary Denby will comprise the New Mexico, Idaho, Tennessee, Mississippi, Arizona, Oklahoma and Nevada, the announced intention of the Navy Department being to concentrate in those waters the oil-burning units of the first line.

The Newport News yard is engaged largely on naval work, having the battleship West Virginia, a sister to the Maryland; the battlecruisers Constellation, and Ranger, and the 43,200-ton battleship Iowa. Two tankers, John D. Archbold and William Rockefeller, are under construction for the Standard Oil of New Jersey.

New York

The 535 combination American Legion, built by the New York Shipbuilding Corporation for the Shipping Board, was given her trial trip in July. She developed a speed of 20.92 knots, although her contract called for only 17½. Officers of the American Legion were guests on the run. The Blue Hen State, the last of seven 522-foot liners, was delivered by the Camden yard early in July.

Port Arthur

W. E. Decker has been appointed

purchasing agent of the Port Arthur Shipbuilding Company, Port Arthur, Ontario, succeeding N. S. Thrasher, who died recently. The Cleveland office, at which Mr. Thrasher was stationed, has been closed. The Port Arthur has no new work on hand, its last vessel, the Canadian Harvester, having been delivered May 17.

Submarine Boat

The Submarine Boat Corporation has completed the last vessel building at the yard, the motorship Suphenco, 5350 tons, for its own account.

Sun

The new 10,000-ton drydock at the plant of the Sun Shipbuilding Company, Chester, is now in operation. The first vessel to go in the dock was the Joseph M. Cudahy, owned by the Sinclair Oil Company, which docked June 11.

The Sun yard expected to deliver the Sun Oil tanker J. N. Pew and the Agwi tanker Agwiwarve in July and to launch the Agwimex the same month. The Tidewater Oil tanker David McKelvey was delivered on June 30.

Texas

The Texas Steamship tanker Illinois, built at its own yard at Bath, was completed July 2. One other vessel, a sister, is under construction.

Union

A standard Crandall railway drydock of 4000 tons' lifting capacity will be installed by the Crandall Engineering Company of Boston at the plant of the Union Shipbuilding Company, Baltimore. This new dock will measure 350 feet over the keel blocks and will be 70 feet wide, with 15 feet of water forward and 20 feet aft over the blocks. The railway will be capable of docking vessels up to and including the 8800-ton class of ships. A large quantity of material is now on the ground and construction will be started as soon as the dredging is completed.

Capitalized at \$10,000, the Astoria Shipping Company has incorporated for the purpose of conducting a general shipping business in Astoria.

The Merchants' Exchange of Vancouver reports having received a radio message from the Canadian-Australasian liner Makura when she was one day out of Auckland, or 6000 miles from Vancouver. This probably is a Pacific ship-to-shore record.

Pacific Coast Notes

Bethlehem

Two 10,100-ton tankers for the Shipping Board, Hamer and Hammac, were delivered by Bethlehem in July, government work, except naval, being brought to an end. The first of three sisters, the Hambro, was completed in June. The 15,000-ton tanker F. H. Hillman, the first of three for the Standard Oil of California, was scheduled to be launched in late July.

Craig

The plant of the Craig Shipbuilding Company at Long Beach, California, is being advertised for sale. It is situated on seventeen acres of land owned by the company and has a waterfrontage of 1600 feet. Connection with the Los Angeles harbor is by a twenty-foot channel. The equipment and buildings include: machine shop and foundry, the former building being of brick and concrete, 450 by 125 feet; tools of the machine and plate shops, woodworking machines, forge shop equipment, 3000-ton floating drydock, 90-ton stiff-leg derrick, locomotive and traveling cranes, air compressors, plates and shapes, etc.

Los Angeles

The 11,000-ton Shipping Board freighter West Prospect, fourth of five sisters building for the Shipping Board, was scheduled to be launched by Los Angeles in July, and the West Faralon, the second of the program, was scheduled for delivery.

The bureau of light and power of the city of Los Angeles has completed the installation of a 600-foot, 33,000-volt power-line from the main city line to the new transformer house alongside the company's floating drydock. This three-phase power-cable has been provided to meet the expansion plans of the company. At the transformer house the power is transformed to operate twelve 100-horsepower, 400-volt motors turning 750 r. p. m. and directly connected to twelve centrifugal 15-inch pumps.

The floating drydock comprises six pontoons. In the center of each pontoon is placed a motor directly connected with a pump below. The two pumps on each of the six pontoons can be operated as a single unit from a center station alongside the big dock or can be operated individually. This convenient and high-powered equipment permits the raising of a ship up to 540 feet in length and weighing 12,000 tons by the en-

tire six pontoons, or the six pontoons can be split into units of one, two, three or more, or grouped into three units of two, or two units of three for the raising of smaller vessels. While at times big freighters and tankers up to 11,000 or 12,000 tons have been raised, frequently passenger ships like the steamship Yale or United States destroyers have been raised on two to four pontoons, and a government oil-barge, steam schooner or private yacht raised on the remaining one or two pontoons. Recently on this dock there was the United States Oil Barge No. 23 on two forward pontoons, followed by the Cabrillo and the Hermosa of the Wrigley fleet of Catalina Island boats on the remaining four.

Mare Island

After work was suspended at the Mare Island Navy Yard because of lack of appropriations, authority was given by Washington to proceed. The superdreadnought California is approaching completion rapidly and probably will be commissioned in August.

Moore

The Moore Shipbuilding Company launched the last vessel under construction, the 10,100-ton tanker Birkhead, for the Vacuum Oil Company, July 9. Since the beginning of the war the Moore yard has launched sixty-two vessels, forty-eight of which were for the Shipping Board. A week before the launching of the Birkhead the 16,340-ton tanker Tamiahua, the largest merchant vessel yet laid down on the Pacific Coast, took the water. She is for the Atlantic Line of the Southern Pacific. The 10,000-ton tanker Bohemian Club was delivered to the Shipping Board July 6. The 4750-ton motorship H. T. Harper was to be delivered to the Standard Oil of California in late July.

Pacific Diesel

The Skandia Pacific Oil Engine Company, Oakland, announces that after July 1 it will operate under the name of Pacific Diesel Engine Company and that it will devote its en-

tire plant to the manufacture of marine and stationary Diesel engines. This means that the hot-bulb Skandia will be discontinued. The company's Diesels are of the Werkspoor design.

Patterson McDonald

Claims of the Patterson-McDonald Shipbuilding Company, Seattle, against the Commonwealth of Australia have been allowed by a board of arbitration to the extent of \$1,028,458.66 of a total of \$1,114,944.40 asked. The claims arose out of the construction of nine 9400-ton wooden vessels. In addition to this large award by the arbitrators (Frank Walker, appointed by the Commonwealth, F. E. Burns, appointed by the company, and W. C. Dawson, selected by the others), the company recently was awarded \$74,000 in ship store claims against Australia and has settled with the Shipping Board for \$354,000. A. M. McDonald, president, said that liabilities did not exceed \$50,000 and that the concern therefore, would pay its stockholders dollar for dollar of their investment plus a large profit. The company's affairs will be wound up.

Southwestern

Southwestern scheduled the 8400-ton tanker Silvanus for delivery to Dutch Shell in July, following her sister ship Scopas, which was completed in June. The last of the three, Semiramis, probably will be launched in late July and delivered in August; and La Purisima, a 7500-ton tanker for Union Oil, is scheduled for August launching and September delivery. La Purisima is the last vessel under construction.

Union Construction

The Coast Guard cutter Tampa probably will be delivered by Union Construction about August 1 and her sister, Haida, two weeks later. The Mojave and Modoc will be launched about September 1, as will the tug Shawnee, also for the Coast Guard. The 8400-ton tanker Achatinna was delivered to Anglo-Saxon Petroleum in July; her sister, Ampullaria, was launched July 2 and will be delivered about the middle of August; and the Amalthus is scheduled to be launched August 13.

Eastern Building Returns

Atlantic and Gulf

AMERICAN BRIDGE COMPANY,
PITTSBURGH, PENN.

Purchasing Agent: W. G. A. Millar.
Twenty-five coal barges Carnegie Steel Co; 175 LBP; 26 beam; 8 loaded draft; 4 launch Mar/21; 5 launch

Apr/21; 3 launch May/21; 2 launch June/21.

Six coal barges US War Dept; 145 LBP; 24 beam; 9 loaded draft; keel Mar/21; 3 launch May/21; 3 launch June/21; all delivered.

Three car floats undischarged interests; 285 LBP; 38 beam; 8 loaded

draft; keel June 21; launch Aug 21, est; deliver Sept 21, est.

Two coal barges, W. G. Coyle & Co, New Orleans; 175x26x8 loaded draft; launch and deliver July 21.

Two tow boat hulls Carnegie Steel Co; 148-2x34-5 loaded draft; launch and deliver Aug 21.

BALTIMORE DRYDOCK & SHIP-BUILDING CO., BALTIMORE

Purchasing Agent: J. G. Miller.
Lio, hull 117, tanker USSB; 430 LBP; 59 beam; 25-4½ loaded draft; 10 loaded speed; 10,250 DWT; turb eng, 3000 IHP; 3 Scotch boilers, 15-3; keel Dec 23/20; launch June 4/21; deliver July 15/21.

Elsie Jean, hull 125, tanker builder's account; 340 LBP; 49 beam; 26-6 loaded draft; 10 loaded speed; 6000 DWT; rec eng, 2000 IHP; 2 Scotch boilers, 15-3; keel Nov 24/20.

J. Macy Willis, hull 126, tanker builder's account; 430 LBP; 59 beam; 25-4½ loaded draft; 10 loaded speed; 10,250 DWT; turb eng, 3000 IHP; 3 Scotch boilers, 15-3; keel Sept 27/20.

S. O. Co. No. 7, hull 127, oil barge Standard Oil NJ; 140 LBP; 28 beam; 6 loaded draft; 8 loaded speed; 265 DWT; 2 Winton engs, 200 BHP each; keel Mar 15/21; launch July 9/21; deliver July 15/21.

Torment, hull 128, fireboat City of Baltimore; 115-6 LBP; 28 beam; 9-6 loaded draft; 12 loaded speed; rec eng, 1000 IHP; 2 B&W WT boilers; keel July 15/21.

BATH IRON WORKS, BATH, MAINE

Purchasing Agent: J. L. P. Burke.
Thomas P. Beal, hull 86, freighter Crowell & Thurlow; 395-6 LBP; 55 beam; 27-1 loaded draft; 10 loaded speed; 9600 DWT; Parsons geared turbine, 2100 SHP; 3 Scotch boilers, 15-6x11-6; keel Nov 20; launch June 16/21; deliver Aug 21, est.

BETHLEHEM SHIPBUILDING CORP., FORE RIVER PLANT, QUINCY, MASS.

Lexington, hull 1300, battle-cruiser U.S.N.
Raleigh, hull 1382, scout cruiser U.S.N.
Detroit, hull 1383, scout cruiser U.S.N.
Massachusetts, hull 1400, battle-ship U.S.N.

And the following nineteen submarines U.S.N.: AA-2, hull 1270; hulls 1309 to 1320 inc, submarines S-18 to S-29 inc; hulls 1389 to 1394 inc; submarines S-42 to S-47 inc.

Agwibay, hull 1395, tanker At-Gulf & W I S S Co; 468-6 LBP; 62-6 beam; 27 loaded draft; 11 loaded speed; 12,620 DWT; rec eng, 3200 IHP; 3 Scotch boilers, 15-3x11-6; keel Aug 27/20; launch May 24/21; deliver June 25/21.

J. Fletcher Farrell, hull 1496, tanker Sinclair Nav Co; 430 LBP; 59 beam; 25-5 loaded draft; 11 load-

ed speed; 10,600 DWT; rec eng, 3200 IHP; 3 Scotch boilers, 15x11-9; launch June 10/21.

William Boyce Thompson, tanker Sinclair Nav Co; sister to above; keel Nov 11/20; launch July 21.

BETHLEHEM SHIPBLDG. CORP., SPARROWS POINT PLANT, SPARROWS POINT, MD.

Pine Tree State, hull 4195, combination USSB; 518 LBP; 72 beam; 30-7 loaded draft; 16 loaded speed; turb eng, 10,000 IHP; 8 Yarrow boilers; keel Feb 15/19; launch Mar 19/21.

Palmetto State, hull 4196; combination USSB; sister to above; keel Feb 19/19; launch June 4/21.

Nutmeg State, hull 4197, combination USSB; sister to above; keel July 29/20.

International, hull 4210, ore and oil International Pet Co; 550 LBP; 72 beam; 32-4 loaded draft; 11½ loaded speed; 20,000 DWT; rec eng 4600 IHP; 3 Scotch boilers, 17-6x12; keel July 22/20.

Bethore, hull 4211, ore and oil Ore SS Co; sister to above; keel Feb 24/21.

Marore, hull 4212, ore and oil Ore SS Co; sister to above, except turb eng; keel May 2/21.

Steelore, hull 4213, ore and oil Ore SS Co; sister to above; keel not laid.

CONSOLIDATED SHIPBUILDING CORPORATION, MORRIS HEIGHTS, N. Y.

Purchasing Agent: Wm. Rayner.
Oak, hull 251, US lighthouse tender; 160 LOA; 30 beam; 9-6 loaded draft; 875 DWT; TE eng, 700 IHP; 1 Scotch boiler, 14 diam; keel Nov 22/20; launch June 18/21.

Hawthorn, hull 252, US lighthouse tender; sister to above; keel Nov 22/20; launch June 28/21.

No name, hull 246, US lightship; 146-3 LOA; 30 beam; 12-7 loaded draft; 825 DWT; comp eng, 400 IHP; 2 Scotch boilers, 10-6 diam; keel Mar 4/21.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO., PHILADELPHIA

Purchasing Agent: Ed. C. Geehr.
Richmond, hull 448, scout cruiser USN; keel Feb 16/20; launch Aug 15/21, est.

Concord, hull 449, scout cruiser USN; keel Mar 29/20; launch Oct 1/21, est.

Trenton, hull 501, scout cruiser USN; keel Aug 18/20; launch Nov 1/21, est.

Marblehead, hull 502, scout cruiser USN; keel Aug 4/20; launch Dec 1/21, est.

Memphis, hull 503, scout cruiser USN; keel Oct 14/20; launch Feb 1/22, est.

OSCAR DANIELS COMPANY, TAMPA, FLORIDA

B. D. Benson, hull 11, Isherwood tanker Standard Oil; 466 LBP; 60 beam; 26-7 loaded draft; 10½ loaded

speed; 11,900 DWT; QE eng, 2800 IHP; 3 Scotch boilers, 15x11-6; keel June 29/20; launch Apr 15/21.

T. J. Williams, hull 12, Isherwood tanker Standard Oil; sister to above; keel Aug 11/20; launch May 3/21; deliver Aug 15/21, est.

FEDERAL SHIPBUILDING CO., KEARNY, N. J.

Purchasing Agent: J. L. Hastings.
Victrolite, hull 49, tanker for Standard Oil of NJ; 500 LBP; 68 beam; 27-6 loaded draft; 11 loaded speed; 15,000 DWT; rec engs, 3500 IHP; 3 Scotch boilers, 16 diam; keel July 22/20; launch June 14/21.

J. A. Moffett Jr, tanker Standard Oil of NJ; sister to above; keel July 23/20; launch July 14/21; deliver July 21, est.

Steel Seafarer, hull 43, freighter US Steel Products Co; 425 LBP; 56 beam; 25-10 loaded draft; 12 loaded speed; 9400 DWT; turb engs, 3100 IHP; 3 Scotch boilers, 15 diam; keel May 25/21; launch Oct 15/21, est; deliver Nov 5/21, est.

Steel Pathfinder, hull 44, freighter US Steel Products Co; sister to the above; keel June 1/21; launch Nov 12/21, est; deliver Dec 3/21, est.

Steel Pioneer, hull 45, freighter US Steel Products Co; sister to the above; keel July 5/21, est; launch Dec 10/21, est; deliver Dec 31/21, est.

GLOBE SHIPBUILDING & DRYDOCK CO. OF MARYLAND, BALTIMORE

Purchasing Agent: H. B. McCauley.
San Leopoldo, hull 101, oil carrier Eagle Oil Transport Co; 401 LBP; 54 beam; 25-1 loaded draft; 10½ loaded speed; 8600 DWT; TE engs, 2800 IHP; 3 Scotch boilers, 15-3x 11-6; keel Sept 20; launch June 25/21; deliver Aug 15/21, est.

San Leonardo, hull 102, oil carrier Eagle Oil Transport Co; sister to above; keel Sept 20; launch July 8/21; deliver Aug 21, est.

LAKE TORPEDO BOAT CO., BRIDGEPORT, CONN.

Purchasing Agent: H. C. Stevens.
S-48, hull 48, submarine U.S.N.; launch Feb 26/21.

S-49, hull 49, submarine U.S.N.; launch Apr 23/21.

S-50, hull 50, submarine U.S.N.; launch June 18/21.

S-51, hull 51, submarine U.S.N.

MERCHANT SHIPBUILDING CORPORATION, CHESTER, PENN.

Purchasing Agent: G. Coit.
Playa, hull 382, tanker Union Oil Co; 424 LBP; 58 beam; 25-5 loaded draft; 10½ loaded speed; 10,000 DWT; TE engs; 3 Scotch boilers, 15-3 x11-7; keel July 22/20; launch June 4/21.

Robert E. Hopkins, hull 383, tanker Tidewater Oil Co; sister to above; keel Aug 30/20.

Samuel G. Brown, hull 384, tanker Tidewater Oil Co; sister to above; keel Oct 1/20.

No name, hull 385, freighter Am-

erican-Hawaiian SS Co: 445 LBP; 59-8 beam; 28-6 loaded draft; 11½ speed; 11,000 DWT; 2 6cyl, 4-cycle Diesel engs, 4500 metric; 1 vertical donkey, 400 sq ft HS; keel Feb5/21.

No name, hull 386, freighter American-Hawaiian SS Co; sister to above; keel Feb10/21; launch July/21, est.

NAVY YARD, BOSTON

Pecos, fuel ship No. 18, USN; 455 LBP; 56-2 beam; 26-8 loaded draft; 14 loaded speed; 14,800 disp; rec eng, 5200 IHP; 4 Ward WT boilers; keel June2/20; launch Apr23/21; deliver Aug/21, est.

Whitney, destroyer tender No. 4 USN; 460 LBP; 60-11 beam; 21 loaded draft; 16 loaded speed; 10,600 disp; geared Parsons turbs, 7000 IHP; 2 WT exp small tube boilers; keel Apr23/21; launch Apr/22, est; deliver Oct/22, est.

NAVY YARD, PHILADELPHIA

Dobbin, hull 7, destroyer tender USN; 460 LBP; 60-10 beam; 21 loaded draft; 16 loaded speed; 10,600 tons disp; Parsons geared turb single screw engs, 7000 SHP; 2 WT boilers; keel Dec23/19; launch May 5/21; deliver date not determined.

Constitution, hull 8, battle cruiser USN; 850 LBP; 105-4 beam; 30-11½ loaded draft; 33½ loaded speed; 43,500 disp; electric drive, 180,000 SHP; 16 WT boilers; keel Sept 25/20; launch and deliver dates not determined.

United States, hull 9, battle cruiser USN; 850 LBP; 105-4 beam; 30-11½ loaded draft; 33½ loaded speed; 43,500 disp; electric drive, 180,000 SHP; 16 WT boilers; keel Sept25/20; launch and deliver dates not determined.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY, NEWPORT NEWS

Purchasing Agent: James Plummer, 233 Broadway, New York City. Maryland, hull 210, battleship USN; 600 LBP; 97-3½ beam; 30-6 mean draft; 32,600 normal disp; 21 speed; GE turbo-elec drive, 28,900 SHP; 8 B&W WT boilers, 41,768 sq ft plus 4168 superheat; keel Apr25/17; launch Mar20/20; deliver July/21.

West Virginia, hull 211, battleship USN; 600 LBP; 97-3½ beam; 30-6 mean draft; 32,600 normal disp; 21 speed; GE turbo-elec drive, 28,900 SHP; 8 B&W WT boilers, 41,768 sq ft plus 4168 superheat; keel Apr 12/20; launch Nov/21, est; deliver Dec/22, est.

Constellation, hull 215, battleship USN; 850 LBP; 101-8½ beam; 31 mean draft; 43,500 normal disp; 33½ speed, est; Westinghouse turbo-elec drive, 180,000 SHP; 16 WT boilers, oil, 198,000 sq ft plus 18,000 superheat; keel Aug18/20; launch and deliver dates not est.

Ranger, hull 215, battle-cruiser USN; sister to above; keel June23/21; launch and deliver dates not est.

Iowa, hull 258, battleship USN; 660 LBP; 105 beam; 33 mean draft; 43,200 normal disp; 23 speed; GE turbo-elec drive, 60,000 SHP; 12 White-Forster WT boilers, oil, 82,800 sq ft plus 8940 superheat; keel May17/20; launch and deliver dates not est.

John D. Archbold, hull 261, tanker Standard Oil NJ; keel Dec15/20; launch Aug/21, est; deliver Oct/21, estimated.

William Rockefeller, hull 262, tanker Standard Oil NJ; sister to above; keel Dec15/20; launch Oct/21, est; deliver Dec/21, est.

NEW YORK SHIPBUILDING CORPORATION, CAMDEN, N. J.

Purchasing Agent: L. G. Buckwalter.

Southern Cross, hull 241, combination USSB; 534 LBP; 72 beam; 30-6 loaded draft; 18 loaded speed; 11,000 DWT; geared turbs, 12,000 SHP; 8 WT boilers; keel Aug/18; launch July20/19; deliver fall/21, est.

American Legion, hull 242, combination USSB; sister to above; keel Jan21/19; launch Oct11/20; deliver July/21.

Blue Hen State, hull 250, combination USSB; sister to above; keel Mar 4/20; launch Feb23/21; deliver July/21.

Bay State, hull 251, combination USSB; 534 LBP; 72 beam; 30-6 loaded draft; 18 loaded speed; 11,000 DWT; geared turbs, 12,000 SHP; 8 WT boilers; keel Oct15/19; launch July17/20; deliver winter/21, est.

Peninsula State, hull 252, combination USSB; sister to above; keel July20/20; launch July6/21; deliver spring/22, est.

Lone Star State, hull 255, combination USSB; sister to above; keel May 13/19; launch Oct23/20; deliver summer/21, est.

Hoosier State, hull 256, combination USSB; sister to above; keel May20/19; launch Oct23/20; deliver fall/21, est.

Yankee Arrow, hull 260, bulk oil Standard Trans Co of NY; 468 LBP; 62-6 beam, 27-0½ loaded draft; 10½ loaded speed; 12,550 DWT; 4 cyl QE engs, 3200 SHP; 3 SE Scotch boilers, 15-2x11-6; keel Aug17/20; launch Apr10/21; deliver summer/21, est.

Empire Arrow, hull 261, bulk oil Standard Trans of NY; sister to above; keel Sept14/20; launch May 24/21; deliver summer/21.

Levant Arrow, hull 262, bulk oil Standard Trans Co of NY; sister to above; keel Nov4/20; launch fall/21, est; deliver winter/21, est.

No name, hull 263, combination Munson SS Co; 414 LBP; 57-6 beam; 23 loaded draft; 15½ loaded speed; 4950 DWT; geared turbs, 5800 SHP; 5 SE Scotch boilers, 16-4x12-3; keel Sept30/20; launch summer/21, est; deliver winter/21, est.

No name, hull 264, bulk oil stock; 419-3 LBP; 56-3 beam; 25-9½ load-

ed draft; 10½ loaded speed; 9870 DWT; 3 cyl TE engs, 3000 SHP; 3 SE Scotch boilers, 15-10x11-4; keel Jan17/21; launch fall/21, est; deliver winter/21.

No name, hull 265, bulk oil stock; sister to above.

Dixie Arrow, hull 266, bulk oil Standard Trans Co of NY; 468 LBP; 62-6 beam; 27-0½ loaded draft; 10½ loaded speed; 12,550 DWT; 4 cyl QE engs, 3200 SHP; 3 SE Scotch boilers, 15-3x11-6; keel Aug17/20; launch fall/21, est; deliver winter/21, est.

Saratoga, hull 198, battle cruiser USN; 874 LOA; 850 LBP; 105-5¼ extreme beam; 31 mean draft; 43,500 normal disp; 33½ loaded speed; GE turbo-electric drive, 180,000 SHP; 16 WT boilers, 198,000 sq ft plus 18,000 superheat; keel Sept25/20.

Colorado, hull 200, battleship USN; 624 LOA; 600 LBP; 97-3½ beam waterline; 30-6 mean draft; 32,600 normal disp; 21 loaded speed; Westinghouse turbo-electric drive, 28,900 SHP; 8 B&W WT boilers, 41,768 sq ft plus 4169 superheat; keel Mar29/19; launch Mar22/21.

Washington, hull 201, battleship USN, sister to above; keel June30/19; launch Sept/21, est.

Hull 267, fuel ship Japanese Navy; 497-8 LOA; 67 beam; 28 designed draft; 15 loaded speed; 13,000 DWT; elec drive, 8000 SHP; 4 B&W boilers; keel fall/21, est.

STANDARD SHIPBLDG. CORPN, SHOOTERS ISLAND, MARINERS HARBOR, N. Y.

Purchasing Agent: Jamie Cortada. Hull 32, fireboat City of New York; 121 LBP; 27 beam; 14-9 deep; 12 loaded speed; comp eng, 900 IHP; 2 B&W WT boilers, oil burning; keel Mar31/21; deliver Sept1/21, est.

STATEN ISLAND SHIPBUILDING COMPANY, STATEN ISLAND, NEW YORK

Purchasing Agent: R. C. Miller. Dixiano, hull 726, sugar ship Am Sug Ref Co; 360 LBP; 50 beam; 23 loaded draft; 10 loaded speed; 6300 DWT; TE eng, 2000 IHP; 2 Scotch boilers, 15x11; keel Sept5/20; launch May21/21.

Hell Gate, hull 728, dredge C. R. Browning; 140 LBP; 48 beam; 15 loaded draft; keel Aug28/20; launch Feb23/21.

Socony 114, hull 734, barge Stand Oil of NY; sister to above; keel Jan 10/21; deliver July9/21, est.

Socony 115, hull 735, barge Stand Oil of NY; sister to above; keel Feb 26/21; deliver July30/21, est.

Hull 736, tugboat Staples Trans Co; 136½ LBP; 27 beam; 16½ loaded draft; 10 loaded speed; 1 TE eng 700 HP; 1 Scotch boiler, 16x11½; keel May16/21; launch July30/21, est; deliver Sept15/21, est.

Hull 737, ferryboat City of New York; 247 LBP; 66 beam; 19½ loaded draft; 15 loaded speed; 1 F&A comp eng, 3500 HP; 4 B&W WT boilers, 13,000 sq ft; keel May 23/21;

launch Aug15/21, est; deliver Oct 17/21, est.

Northwestern, tanker Am Pet Co; 242 LBP; 42 beam; 23 loaded draft; 10 loaded speed; TE eng; 2 Scotch boilers; lengthening job, additional 56 ft, making 2 new cargo tanks, 1000 DWT additional capacity. Vessel considered total loss by fire; raised; and now undergoing general repairs and at the same time lengthening. Job started May31/21; estimated time 4 months.

SUBMARINE BOAT CORP., PORT NEWARK, N. J.

Purchasing Agent: W. C. Lawrence. Suphenco, hull 150, motorship Submarine Boat Corp; 324 LBP; 46-2 beam; 23 loaded draft; 11 loaded speed; 6350 DWT; keel May29/20; launch April2/21; delivered.

SUN SHIPBUILDING COMPANY, CHESTER, PENN.

Purchasing Agent: H. W. Scott. J. N. Pew, hull 39, tanker Sun Oil Co; 480 LBP; 65-9 beam; 26-7 loaded draft; 10½ loaded speed; 12,800 DWT; single screw QE engs, 4300 IHP; 3 SE Scotch boilers, 15-10x 11-11½; keel Nov5/20; launch Apr 23/21; deliver July/21, est.

Agwiharve, hull 40, tanker A. G. W. I. S. Co; 480 LBP; 65-9 beam; 26-7 loaded draft; 12 loaded speed; 12,500 DWT; single screw QE engs, 4300 IHP; 4 SE Scotch boilers, 15-10 x 11-11½; keel Nov26/20; launch Apr 2/21; deliver July/21, est.

Agwimex, hull 41, tanker A. G. W. I. S. Co; sister to above; keel Dec8/20; launch July18/21, est.

Agwisot, hull 42, tanker A. G. W. I. S. Co; sister to above; keel Dec23/20; launch July2/21, est; deliver July 30/21, est.

Agwistates, hull 43, tanker A. G. W. I. S. Co; sister to above; keel Jan3/21; launch July16/21, est; deliver Aug15/21, est.

David McKelvey, hull 45, tanker Tidewater Oil Co; 430 LBP; 59 beam; 25-7 loaded draft; 11 loaded speed; 10,600 DWT; TE engs, 2600 IHP, est; 3 SE Scotch boilers, 15-10x11½; keel Feb 23/21; launch June 4/21; deliver June30/21.

No name, hull 46, tanker Sun Oil Co; 480 LBP; 65-9 beam; 26-7 loaded draft; 10½ loaded speed; 12,800 DWT; single screw QE engs, 4300 IHP; 3 SE Scotch boilers, 15x11-11½; keel Apr/21; launch Aug30/21, est; deliver Sept30/21, est.

No name, hull 47, tanker Sun Oil Co; sister to above; keel Apr/21; launch Sept3/21, est; deliver Oct 3/21, est.

TERRY SHIPBUILDING CORP., SAVANNAH

Purchasing Agent: H. A. Bittner. Hull 69, oil-barge builders' acct; 285 LBP; 44 beam; 21 loaded draft; 3500 DWT.

Hulls 70, 71, 72; sisters to above; work suspended.

TEXAS STEAMSHIP COMPANY, BATH, MAINE

Purchasing Agent: A. R. Weber. Illinois, hull 31, tanker Texas S S Co; 415-10 LBP; 56 beam; 25-7½ loaded draft; 11½ loaded speed; 9600 DWT; TE engs, 3000 IHP; 3 Scotch boilers, 15-3x11; keel Oct 19/20; launch June11/21; deliver July 2/21.

No name, hull 32, tanker Texas S S Co; sister to above; keel Nov10/20.

American Lakes

ANCHOR SHIPBUILDING CO., WASHBURN, WIS.

Purchasing Agent: Geo. F. Morgan. Double ended ferry, Hudson & Athens Co; 113 LBP; 33 beam; 7 loaded draft; 8 loaded speed; Ingersoll-Rand Diesel engs, 300 IHP; keel Feb/21; launch May/21; deliver July/21.

United States

BETHLEHEM SHIPBUILDING CORPORATION, LTD. Potrero Works

Purchasing Agent: O. W. Street. Hammac, hull 5274, tanker USSB; 435 LBP; 56 beam; 26 loaded draft; 11 loaded speed; 10,100 DWT; rec engs, 2600 IHP; 3 Scotch marine boilers, 15x11-9; launch May25/21; deliver July/21.

Submarines USN: S-31, hull 136; S-32, hull 137; S-33, hull 138; S-34, hull 139; S-35, hull 140; S-36, hull 141; S-37, hull 142; S-38, hull 143; S-39, hull 144; S-40, hull 145; launch Jan5/21; S-41, hull 146.

Alameda Works

Hamer, hull 5273, tanker USSB; 435 LBP; 56 beam; 26 loaded draft; 11 loaded speed; 10,100 DWT; rec engs, 2700 IHP; 3 Scotch marine boilers, 15x11-9; keel Nov12/20; launch May21/21; deliver July/21.

Chilore, hull 5309, combination ore and coal carrier Ore Steamship Co; 571-6 LOA; 550-1 LBP; 72 molded beam; 44 molded depth; 32-4 loaded draft; 11½ loaded speed; 20,000 D WT; Curtis turbines with Falk reduction gears, 5000 SHP; 3 Scotch SE boilers, 17-6x12, each 4287 sq ft; oil burners.

Lebore, hull 5310, combination ore and coal carrier Ore Steamship Co; sister to above.

F. H. Hillman, hull 5311, tanker Stand Oil Co of Cal; 500 LBP; 68 beam; 25-11 loaded draft; 11 loaded speed; 15,000 DWT; rec engs, 4000 IHP; 3 Scotch marine boilers, 16x 12-9; keel Jan10/21; launch July/21, est; deliver Nov1/21, est.

H. M. Storey, hull 5312, tanker Stand Oil Co of Cal; sister to F. H. Hillman; keel Jan19/21.

W. S. Rheem, hull 5313, tanker

Canadian

CANADIAN VICKERS, LTD., MONTREAL

Topdalsfjord, hull 82, single-screw steel 2-deck cargo Norwegian-America Line; 365 LBP; 49½ beam; 29 loaded draft; 11½ loaded speed; 6400 DWT; TE engs, 2600 IHP; 3 Scotch boilers, 14-9 with superheaters; keel July29/20; launch May5/21; deliver July16/21, est.

DAVIE SHIPBUILDING & REPAIR- ING COMPANY, LTD., LAUZHON LEVIS, P. Q., CANADA

Purchasing Agent: N. W. Van Wyck.

Canadian Challenger, hull 476, single-screw cargo Canadian government; 400 LBP; 52 beam; 25-3 loaded draft; 11½ loaded speed; 8350 D WT; TE surface cond engs, 3000 I HP; 3 Scotch marine boilers, 15-6x 11-6; keel May14/20; launch July 7/21.

On the Pacific Coast

Stand Oil Co of Cal; sister to F. H. Hillman; keel Mar1/21.

HANLON DRYDOCK & SHIP- BUILDING CO., OAKLAND

Purchasing Agent: R. Barker. Dan F. Hanlon, hull 89, steam schr. D. J. Hanlon; 2500 DWT; 1400 IHP engines; 2 B&W boilers.

LOS ANGELES SHIPBUILDING & DRYDOCK CO., SAN PEDRO

West Farallon, hull 32, steel cargo USSB; 430 LBP; 54 beam; 28-2 loaded draft; 10½ loaded speed; 11,000 DWT; TE engs, 3500 IHP; 3 Scotch single end, 15-9; keel Sept27/20; launch Apr19/21; deliver July/21, estimated.

West Greylock, hull 33, steel cargo USSB; sister to above; keel Nov10/20; launch June/21; deliver Aug 9/21, est.

West Prospect, hull 34, steel cargo USSB; sister to above; keel Dec31/20; launch July/21, est; deliver Sept 14/21, est.

West Chopaka, hull 35, steel cargo USSB; sister to above; keel Feb24/21; launch Sept6/21, est; deliver Nov25/21, est.

MOORE SHIPBUILDING COM- PANY, OAKLAND

Purchasing Agent: W. E. Hostetter. Bohemian Club, hull 2862, tanker USSB; 425 LBP; 57 beam; 26 loaded draft; 10,000 DWT; rec eng; three Scotch boilers, 15-2x11; keel Oct23/20; launch May14/21; deliver July 6/21.

Tustem, hull 2863, tanker USSB; sister to the above; keel Nov24/20; launch June15/21; deliver Aug15/21, estimated.

Lubrico, hull 2864, tanker USSB; sister to above; keel Jan/21; launch June15/21; deliver Aug30/21, est.

H. T. Harper, hull 163, tanker Standard Oil Co of California; 330

LBP; 46 beam; 21-6 loaded draft; 4750 DWT; Skandia Diesel engs; keel Oct/20; launch June/21; deliver July/21, est.

Tamiahua, hull 165, tanker S. P. Atlantic S S Co; 520 LBP; 71 beam; 28 loaded draft; 16,340 DWT; rec engs; 3 Scotch boilers, 15-9x12; keel Feb/21; launch July/21; deliver Aug/21, est.

Birkenhead, hull 166, tanker for Vacuum Oil Co; 425 LBP; 57 beam; 26-3 loaded draft; 10,100 DWT; rec engs; 3 Scotch marine boilers, 15-2x 12; keel Dec/20; launch July/21; deliver Aug/21, est.

NAVY YARD, PUGET SOUND
Medusa, repair ship for government; 460 LBP; 70 beam; about 19 loaded draft; 17-5 loaded speed; turbine eng, 7000 IHP; 2 WT express type boilers; 10,000 tons disp; keel Jan/20; launch and deliver dates not set.

Holland, submarine tender for government; 460 LBP; 61 beam; about 20 loaded draft; 16 K loaded speed; turbine eng, 7000 IHP; two WT express type boilers; 10,000 tons disp; keel April/21.

NAVY YARD, MARE ISLAND
California, battleship USN; 600 L BP; 97-3½ beam; 30-3 loaded draft; 21 loaded speed; 32,300 disp; turbo-electric engs, 26,800 SHP; 8 Bu's express boilers, 50,984 sq ft; keel Oct/25/16; launch Nov/20/19; deliver Aug/21.

Montana, battleship USN; 660 L BP; 105 beam; 33 loaded draft; 23 loaded speed; 42,200 disp; turbo-electric engs, 60,000 SHP; 12 Bu's express boilers, 74,040 sq ft; keel Sept/1/20.

Wasmuth, destroyer USN; 310 L BP; 30-1½ beam; 9-4 loaded draft; 35 loaded speed; 1215 disp; geared turbine eng, 26,000 SHP; 4 Normand boilers, 27,000 sq ft; keel Aug/12/19; launch Sept/15/20.

Trevel, destroyer USN; sister to above; keel Aug/12/19; launch Sept/15/20.

Perry, destroyer USN; sister to above; keel Sept/15/20.

Decatur, destroyer USN; sister to above; keel Sept/15/20.

SOUTHWESTERN SHIPBUILDING CO., EAST SAN PEDRO

Purchasing Agent: J. J. Wilson.
La Purissima, hull 23, Isherwood tanker Union Oil Co; 392 LBP; 51 beam; 23-11 loaded draft; 11½ loaded speed; 7500 DWT; TE engs, 2800 IHP; 3 Scotch boilers, 14x12; keel Dec/22/20; launch Aug/21, est; deliver Sept/21, est.

Nilverus, hull 25, Isherwood tanker Nederlandsch-Indische Tankstoomboot Maatschappij; 412 LBP; 53 beam; 24-7 loaded draft; 11 loaded speed; 8400 DWT; TE engs, 2700 IHP; 3 Scotch boilers, 15-6 x 11-7; keel Oct/20/20; launch June/30/21; deliver July/21, est.

Semiramis, hull 26, Isherwood tanker Nederlandsch-Indische Tankstoomboot Maatschappij; same as above;

keel Nov/5/20; launch July/21, est. deliver Aug/1/21, est.

TODD DRYDOCK & CONSTRUCTION CORP., TACOMA

Purchasing Agent: C. L. Bankson.
Omaha, hull 100, scout cruiser US N; 555-6 LOA; 550 LBP; extreme beam 55-4; molded beam 54-9; depth molded 26; mean loaded draft 13-6; disp 7100 tons; Westinghouse Parsons turbines and reduction gear, 105,000 IHP; designated speed 34; 12 Yarrows WT boilers; keel Dec/6/18; launch Dec/14/20.

Milwaukee, hull 106, scout cruiser USN; sister to above; keel Dec/13/18; launch Mar/24/21.

Cincinnati, hull 107, scout cruiser USN; sister to above; keel May/15/20; launch May/23/21.

UNION CONSTRUCTION CO., OAKLAND

Tampa, hull 16, cutter USCG; 240 LOA; 39 beam; 14 loaded draft; 16 loaded speed; 1600 DWT; turbo-electric engs, 2600 IHP; 2 WT boilers; keel Sept/27/20; launch Apr/16/21; deliver Aug/1/21, est.

Haida, hull 17, cutter for USCG; same as the above; keel Sept/27/20; launch Apr/19/21; deliver Aug/15/21, estimated.

Mojave, hull 18, cutter USCG; same as the above; keel Apr/16/21; launch Sept/1/21, est.

Modoc, hull 19, cutter USCG; same as above; keel Apr/19/21; launch Sept/1/21, est.

Shawnee, hull 20, cutter USCG; 150 LOA; 30 beam; 13-6 loaded draft; 12½ loaded speed; 1000 DWT; rec engs, 1000 IHP; 2 WT boilers; keel June/1/21; launch Sept/1/21, est.

Achatina, hull 21, oil tanker Anglo-Saxon Pet Corp, Ltd; 412 LBP; 53-6 beam; 24-9 loaded draft; 11 loaded speed; 8400 DWT; rec engs, 2600 IHP; 3 Scotch marine boilers, 15-6 x 11-7; keel Dec/15/20; launch May/21/21; deliver July/21.

Ampullaria, hull 22, oil tanker Anglo-Saxon Pet Corp, Ltd; sister to Achatina; keel Feb/5/21; launch July/2/21; deliver Aug/1/21, est.

Amalthus, hull 23, oil tanker Anglo-Saxon Pet Corp, Ltd; sister to Achatina; keel Mar/12/21; launch Aug/13/21, est.

All cutters on transverse system; others on Isherwood system.

Canadian CHOLBERG SHIPYARD, VANCOUVER, B. C.

Purchasing Agent: W. Meed.
Sir Henry Drayton, hull 5, 4-masted barkentine Victoria Shipowners, Ltd; 250 LOA; 45-6 beam; 21-10 loaded draft; 2400 DWT; sailing vessel; shaft logs fitted for auxiliary but no machinery installed; keel May 15/20; launch Aug/1/21, est.

No name, hull 6, 4-masted barkentine Victoria Shipowners, Ltd; sister to above; keel June/4/20; launch Oct 1/21, est.

No name, hull 7, 4-masted barkentine Victoria Shipowners, Ltd; sister to above; keel Feb/21.

J. COUGHLAN & SONS, LTD., VANCOUVER, B. C.

Purchasing Agent: J. Joseph.
Canadian Transporter, hull 20, steel freighter Canadian government; 400 LBP; 52 beam; 25-3 loaded draft; 11½ loaded speed; 8350 DWT; TE eng, 3000 IHP; 3 Scotch boilers, 15-6 x 11-6; keel Jan/6/21.

Canadian Freighter, hull 21, steel freighter Canadian government; sister to above; keel Jan/6/21.

PRINCE RUPERT DRYDOCK & ENGINEERING COMPANY, PRINCE RUPERT

Canadian Scottish, steel cargo Canadian government; 8390 DWT; 2-deck; bridge, poop and forecastle; 11 speed; keel Sept/27/19; launch May/17/21.

Canadian Thrasher, steel cargo Canadian government; 8390 DWT; 2-deck; bridge, poop and forecastle; 11 speed; keel Oct/20/19; launch Aug 15/21, est.

These vessels are being completed by the Wallace Shipbuilding & Drydock Co, North Vancouver. The terms are time and material plus 8 per cent.

WALLACE SHIPBUILDING & DRYDOCK CO., VANCOUVER, B. C.

Coastwise steamship Canadian Pacific; 317 LBP; 48 beam; 18½ deep; 16 knots; single-screw; 600 tons cargo space; accommodations for 200 passengers; keel Oct/20; launch July/21, est.

Miscellaneous Construction

COLUMBIA STEEL COMPANY, PITTSBURG, CALIF.

Steel castings for many steel vessels now under construction in the Pacific Coast yards, including the dreadnought Montana and the sister ships 49, 50, 52; also for Coast Guard cutters under construction in the Union Const. Co. yard.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO., PHILADELPHIA

Twelve Parsons manganese bronze propellers for scout cruisers 4, 5 and 6 building by Todd Drydock & Const. Corp., Tacoma. Two right-hand and two left-hand propellers for each vessel. Weight of propellers 13,200 pounds each; diameter 11-3; pitch 11-10.

ALLAN CUNNINGHAM COMPANY, SEATTLE

On order and under construction: 6 steam and electric steering gears; 13 steam and electric anchor windlasses; 18 steam and electric and hydro-electric and hand capstans; 37 steam and electric winches.

DOW PUMP & DIESEL ENGINE COMPANY, ALAMEDA

H. T. Harper, motorship Standard Oil Co; one 200 IHP, two 267 IHP Diesel auxiliary electric drive engs.

JAMES C. H. FERGUSON, SALES AGENT, MONADNOCK BLDG., SAN FRANCISCO

American Engineering Co.: Four steering engines, ferries Newark and Piedmont; electric capstans drydock Moore; hydraulic telemotor, hull 2077, Moore; 3 towing machines, 4 steering engines. Shipowners & Merchants' Tugboat Co.

Pneumercator Co.: 116 pneumercators USS California, Mare Island; 40 for 4 Coast Guard cutters, Union Construction; 8 for West Farallon; West Greylock, West Prospect, West Chopaka, Los Angeles; 60 for 12 submarines USN, Bethlehem.

Rostand Mfg. Co.: air ports and lenses complete 4 Coast Guard cutters and 4 Anglo-Saxon tankers, Union Construction Co.

FORD & GEIRRIE, AGENTS, SAN FRANCISCO

National stockless anchors, Union Walton Co., for hull 165 at Moore's; Dean feed pumps, Dean Bros' Steam Pump Works, for 166 at Moore's; Reliance forced draft equipment, Jno Reid & Co., for hulls 165, 166 at Moore's; National stockless anchors Union Walton Co., hull 166, Moore's; Dean feed pumps, Dean Bros' Steam Pump Works, hull 23, Southwestern; Willett Bruce whistle control, McNab Co., hulls 16, 17, 18, 19, Union Construction; McNab direction indicators, McNab Co., hulls 16, 17, 18, 19, Union Construction; Reliance forced draft equipment, John Reid & Co., hull 23, Southwestern; Anchor chain, Lebanon Chain Co., hull 23, Southwestern; windlass, gypsy and steering gear, Hyde Windlass Co., hull 20, Union Construction; Welin davits, American Balsa Co., hulls 5311-2-3, Bethlehem, hull 163, Moore; Reliance furnace fronts, John Reid & Co., hulls 2862-3-4, Moore; Willett-Bruce whistle control, McNab Co., hulls 5311-2-3, Bethlehem; McNab direction indicator, hulls 31-2-3-4-5, Los Angeles; Balsa wood for cold storage, American Balsa Co., hulls 5311-2-3, Bethlehem; Welin davits, American Balsa Co., hulls 2862-3-4 and hull 165, Moore; White fuel oil burners, Todd Dry Docks, hull 165, Moore; Mills releasing gear, hulls 24-5-6, Southwestern; Ebrady releasing gear, hull 165, Moore; balsa wood cold storage, American Balsa Co., hull 23, Southwestern; ash hoist, Hyde Windlass Co., hull 165, Moore.

PACIFIC DIESEL ENGINE COMPANY, OAKLAND

(Formerly Skandia Pacific Oil Engine Company)

Purchasing Agent: A. Bolander, Ten 850 BHP Warkopool Diesel engines building for USSB: 6 cyl, 135 RPM; 8 delivered.

One 150 BHP Warkopool Diesel marine engine.

STEWART DAVIT & EQUIPMENT CORP., NEW YORK, SAN FRANCISCO, SEATTLE

Stewart davits are being installed

in the following: At Union Const Co: Coast Guard cutters, hulls 16, 17, 18, 19; Canadian Pacific lines, Wallace yard, Vancouver.

Drydocking and Repairs

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Potrero Works

Miscellaneous repairs, drydocking, painting: P. C. Dredging Co. Barge No. 4; W. S. Miller, Venetia, Pa-pete, David Scannell, Dennis Sullivan, Madrona, El Aquador, Oronite, Kern, Mohican, Lotus, Standard No. 2, Governor Markham, Dredge No. 3, Willpolo. Repairs to winches: Pomona. Condenser repairs: Sherman. Miscellaneous repairs: Steel Age, Govontalo, Ventura, Lewis Luckenbach, Lyman Stewart, Harry Luckenbach, Mexican, Johanna Smith (also drydocking), Cuba, Steel Worker, Washington, Tancred, Rose City. Work on paddle wheel: San Pedro. Engine, boiler, hull repairs, drydocking, painting: Tahiti, Stockton, West Calera. New tailshaft: Atlas. Engine, boiler, hull repairs: Maui, Wairuna, Santa Rita. New propeller: Wm. H. Doheny (complete), Santa Fe Tug El Dorado. Repairs to crankshaft: West Caddoa. Remetal turbine bearing: Andrew Luckenbach. New air pump: Alaskan. Fire damage repairs: E. P. Ripley. Boiler repairs: Steel Worker. Bottom repairs, drydocking, painting: Scopas. Installing Foamite system: Bradford. Fuel pump repairs: Lansing.

Alameda Works

Miscellaneous repairs: Stanwood, Tiverton (also new foremast), Idaho, Katherine, K. R. Kingsbury, D. G. Scofield. Miscellaneous repairs, docking, painting: Sampson, Chas. Van Damme, Alumna, Nome City, Phyllis (repairs to donkey boiler). Installing tailshaft, bearing, propeller: F. S. Loop. New propeller: Fort Bragg.

LOS ANGELES SHIPBUILDING & DRYDOCK CO., SAN PEDRO

Cleaning and painting: Avalon, Bedford, Vaguer; Destroyers Farquhar No. 304, Thompson No. 305, Wickes 75, Evans 78, Aaron Ward, Zellin 313, Bruce 329, William Jones 308, Woodbury 309, Percival 298, Leo 310, Young 312, J. F. Burns 299, Roper 147, Talbot 114 (also repairs to propeller), Waters 115, Dorsey 117 (also repairs to propeller), McCormick 223, Bahada, Lewark. New stern sleeve: Carlos. Minor hull repairs: Destroyer Dent 116, Yale (also to electric equipment), Santa Rosalia. Survey: Scopas. Minor machinery repairs: West Hika, West Togos, Harry Luckenbach (also to boilers), George Washington. Extensive boiler repairs, installing new turbine gears, new gravity lubrication system, superheaters and soot blowers: Edward Luckenbach. New crankshaft for pumping engine and

complete overhauling of same: U. S. Dredger.

MOORE SHIPBUILDING COMPANY, OAKLAND

Engine repairs: West Hixton, Bali, Willfaro, Ventura. Drydocking, cleaning, painting, miscellaneous repairs: Wolverine State, Coaba, Brooklyn, Georgina Rolph, Ryder Hanify, Santa Monica, Fernwood, West Camargo, Amy Turner, Tamalpais, King Cyrus, Coquille, Curacao, Lightship 83. Drydocking, cleaning, painting, wheel work: Richmond. Drydocking, miscellaneous hull repairs: Fred Baxter. Wheel work: S. C. T. Dodd, Claremont. Miscellaneous engine and hull repairs: Colusa, Sherman. Miscellaneous repairs: Golden State Pomona.

NAVY YARD, PUGET SOUND

Drydocking, cleaning, painting bottom, miscellaneous repairs: Arkansas, New York, Wyoming, West Jessup. Care and preservation: Seattle, Oregon, Missoula, Charlotte, S. C. Chaser No. 310. Miscellaneous repairs and alterations: Destroyers Bailey, Delphy, Thornton, Tingey, Morris, Swasey, Meade, Gillis, Rathburne, Waters; Orion, Vicksburg, Neptune, Bath, Bothwell, Eagle No. 57, Pawtucket, Sotomoto, Tatnuck, Iroquois, Mahopac.

SOUTHWESTERN SHIPBUILDING CO., EAST SAN PEDRO

General repairs: Point Adams, Venezuela (to boilers), West Jena (and dynamos). Winches: West Hika. Electrical: Stockton.

TODD DRYDOCKS, INC., SEATTLE

Repairs account collision damage: West Hartland. Cleaning and painting: Gazeka, Hoquiam, Aberdeen, Barges Nos. 3 and 4. Miscellaneous repairs: Westley, Forest King, Ensign (also survey), West Ivis, Admiral Watson (also survey), Indianapolis, Sioux, Tacoma. Drawing tailshaft, etc.: Milwaukee. Cleaning, painting, miscellaneous repairs: City of Spokane, West Jessup, Acquila, Yosemite, Bolcom, Creosote, Dan Kern.

UNION SHIPBUILDING COMPANY, BALTIMORE, MD.

Miscellaneous engine and hull repairs: Palisades, Coelada, Western Maid, Liberator, Cape Romaine, Des Moines Bridge, Western Star, Capulin, C. H. Cramp, J. M. Guffey, Waban, Osawatimie, Otho, City of St. Joseph, West Huron.

YARROWS, LIMITED, VICTORIA

Cleaning, painting, repairs: Princess Adelaide, Princess Alice, John A. Lee, Princess Charlotte, Scow No. 11, Teco (also making and fitting new propeller). Repairs to bottom due to stranding: Canadian Inventor. Cleaning, painting: Black, Brown, Blue, Green (Consolidated Whaling Corporation).

About Folks

H. F. Alexander has been re-elected president, and A. F. Haines vice-president and general manager, of the Pacific Steamship Company. Both were re-elected to the directorate at the annual meeting July 5. The following other directors were re-elected: R. Stanley Dollar, vice-president; A. M. Dollar, treasurer; M. A. Arnold, James D. Hoge, D. C. Jackling, E. A. Stuart, E. C. Ward, Chester Thorne, W. C. Morrow, and B. S. Grosscup.

H. I. Zimet, formerly vice-president of A. F. Thane & Company, has been appointed manager of the export department of the Charles R. McCormick Company, San Francisco.

Elmer Schlessinger of Chicago has been appointed general counsel of the Shipping Board, succeeding E. M. Hyzer, who will remain as assistant.

Commander V. V. Woodward, manager of the repair department, division of construction and repair, Shipping Board, is chairman of a newly-created trial trip board, which will have charge of everything connected with the performance of new vessels. Other members are: H. B. Taylor, chief turbine engineer; G. K. Nichols, Delaware River district manager, and A. Conti, technical department.

Arthur E. Goddard and James S. Milne, directors of the Todd Shipyards Corporation whose terms had expired, were re-elected for terms of four years at the annual meeting.

Frank M. Warren, president of the Port of Portland Commission, has announced the following committee appointments:

River and harbor improvements—Commissioners Warren, Kelly, Metschan and Mahoney.

Auditing and finance committee—Commissioners Metschan, Sargent, Kenworthy and Thompson.

Plant and construction committee—Commissioners Kelly, Mahoney, Porter and Warren.

Committee on employees, salaries, etc.—Commissioners Thompson, Corbett, Metschan and Porter.

Traffic committee—Commissioners Sargent, Kelly, Corbett and Kenworthy.

Committee on consolidation with the dock commission—Commissioners Warren, Sargent and Kelly.

R. McKenzie, first officer of the steamship Prince Rupert, whose license was suspended for two months, has had his license restored by a supreme court judge of Van-

couver and costs of the inquiry were charged to the commissioner who suspended him, on the ground that he had not had a fair opportunity to defend himself.

D. G. Cooke, recently appointed Northwest traffic manager of the General Steamship Corporation, with headquarters in Seattle, has assumed his duties, succeeding E. McConalogue, who has taken charge of the company's business on the Columbia River.

Ben C. Dailey, formerly of the Overseas Shipping Company, San Francisco, has become business manager of the American Fumigation Company.

Charles Van Brunt, formerly chief steward of the Pacific Mail steamship Ecuador, has been appointed port steward, San Francisco.

Daulton Mann, assistant general manager of the Pacific Mail, San Francisco, a son; Harry Naughton, assistant general passenger agent, a son; Paul Faulkner, editor of the house publication, a daughter—such is the Pacific Mail log of June.

W. T. Smith, vice-president of the Merchant Shipbuilding Corporation, who had been chairman of the Atlantic Coast Shipbuilding Industrial Board since its inception, resigned as a member June 21. J. L. Ackerson, president of the Atlantic Coast Shipbuilders' Association and also a vice-president of the Merchant Shipbuilding Corporation, who replaced Mr. Smith as a member of the board, was unanimously elected chairman, his nomination being presented and seconded by the labor representatives. William G. Cox, vice-president of Pusey & Jones, and Ernest Lee Jahncke, president of the Jahncke Drydock & Ship Repair Corporation, New Orleans, have been chosen to fill vacancies in the employers' representation on the board. The five labor representatives are: James J. O'Connell, president of the Metal Trades Department of the American Federation of Labor; L. L. Lettner, International Association of Machinists; John Tobin, International Brotherhood of Blacksmiths, Drop Forgers and Helpers; Charles F. Scott, International Brotherhood of Boilermakers, Iron Shipbuilders and Helpers, and James A. Cooley, International Union of Steam & Operating Engineers.

Captain Omar J. Humphrey of the United American Lines has been presented by the British India Steam Navigation Company with a watch in recognition of his rescue of 611

passengers of the steamship Sazilka, which was wrecked in the Bay of Bengal in 1919. At that time Captain Humphrey was in command of the West Modus.

Harris Livermore has resigned as president of the United American Lines to take up special work for that company and associated firms, especially abroad.

Seth Mann, attorney and manager of the traffic bureau of the San Francisco Chamber of Commerce, was elected president of the Pacific Coast Traffic League at a meeting in San Francisco in June. Other officers were elected as follows: J. H. Lathrop, vice-president; Hal M. Remington, secretary-treasurer. As directors of the association in addition to the president and vice-president, who are ex-officio members of the board, F. P. Gregson, F. M. Hill and J. W. McCune were elected. The latter is secretary of the Traffic and Transportation Bureau of the Tacoma Commercial Club and Chamber of Commerce.

A. C. Clark has been appointed Eastern Washington soliciting agent of the Seattle Port Commission. He will pay particular attention to stimulating shipments of apples and other fruits through Seattle.

T. B. Randall, assistant marine secretary of the Commercial Union at San Francisco, has accepted an appointment as assistant marine underwriter for the Pacific Coast marine office of the Norwich Union, Union Marine and Phoenix Assurance under George H. Ismon, underwriter. George Hansen, late of the George E. Billings Company, has succeeded Mr. Randall.

Among the shipping men who will sail on the Hoosier State on the San Francisco Chamber of Commerce excursion to the Orient September 22 are: Oliver J. Olson, F. J. Wood, C. A. Thayer. The date has been changed from September 3.

H. E. Murray has been appointed collector of customs at Honolulu, succeeding Malcolm A. Franklin, resigned.

Ralph J. Chandler, president of the shipbuilding company that bears his name, has succeeded A. J. Frey as general manager of the Los Angeles Steamship Company, operator of the Yale and Harvard in the San Francisco-Los Angeles service. Mr. Frey recently was appointed director of operations of the Shipping Board.

J. T. Lilly, of Norton, Lilly & Company, New York, visited the principal ports of the Pacific Coast in July.

SE 8-1521

Pacific Marine Review

The National Magazine of Shipping



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September
1921



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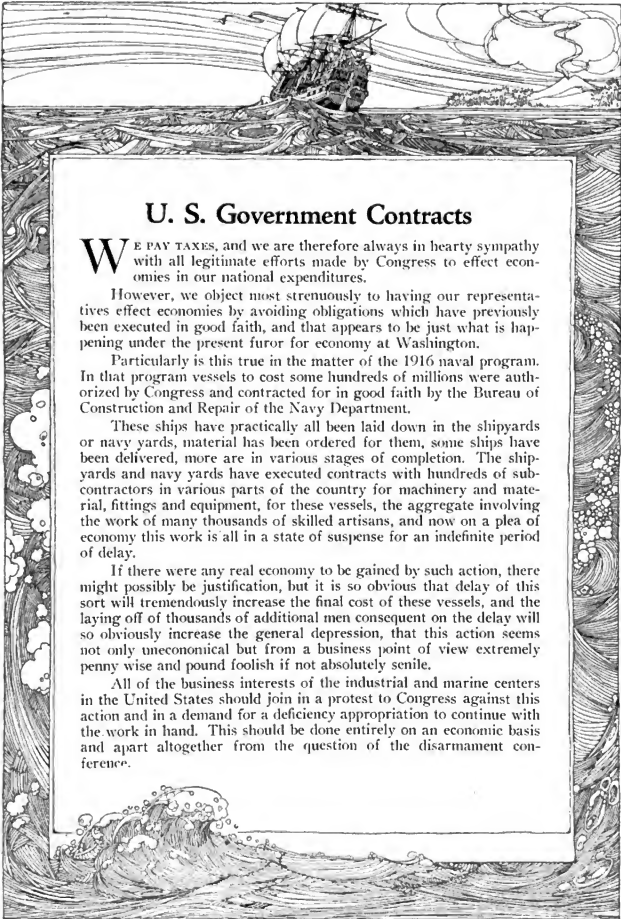
Below is a Partial List of Customers who have used—and are using—our Sleeves.

Some users of our fluid compressed seamless tubes for Propeller Shaft Sleeves
and pump and Press Liners and Roll Covers, Ship and Marine Engine Builders:

Wm. Cramp & Son Ship & Engine Building Co.,
Philadelphia, Pa.
Hardie Tynes Mfg. Co., Birmingham, Ala.
U. S. Navy Department
Federal Shipbuilding Co., Kearny, N. J.
N. Y. Shipbuilding Corp'n, Camden, N. J.
Newport News Shipbuilding & Dry Dock Co., New-
port News, Va.
Atlantic Corporation, Portsmouth, N. H.
American Shipbuilding Co., Cleveland, Ohio
Toledo Shipbuilding Co., Toledo, Ohio
McDougall-Duluth Co., Duluth, Minn.
Kraft Ship Yards & D. D. Co., Chicago, Ill.
Saginaw Shipbuilding Co., Saginaw, Mich.
Westinghouse Electric & Mfg. Co., Lester, Pa.
Merchant Shipbuilding Corp'n, Bristol, Pa.

Mesta Machine Co., Pittsburgh, Pa.
Grant-Smith-Porter Ship Co., Portland, Ore.
Pacific Coast Shipbuilding Co., San Francisco, Cal.
Johnson Iron Works, New Orleans, La.
International Shipbuilding Co., Gulfport, Miss.
American Bridge Co., Chicago, Ill.
W. & A. Fletcher Co., Hoboken, N. J.
Robins Dry Dock & Repair Co., Brooklyn, N. Y.
Llewellyn Iron Works, Los Angeles, Cal.
Reading Iron Works, Reading, Pa.
Allis-Chalmers Co., Milwaukee, Wis.
Downey Shipbuilding Co., Arlington, Staten Island
Bath Iron Works, Bath, Me.
Collingwood Shipbuilding Co., Collingwood, Ont.
Staten Island Shipbuilding Co., Staten Island, N. Y.
Groton Iron Works, Groton, Conn.

The Sandusky Foundry & Machine Co.
Sandusky, Ohio



U. S. Government Contracts

WE PAY TAXES, and we are therefore always in hearty sympathy with all legitimate efforts made by Congress to effect economies in our national expenditures.

However, we object most strenuously to having our representatives effect economies by avoiding obligations which have previously been executed in good faith, and that appears to be just what is happening under the present furor for economy at Washington.

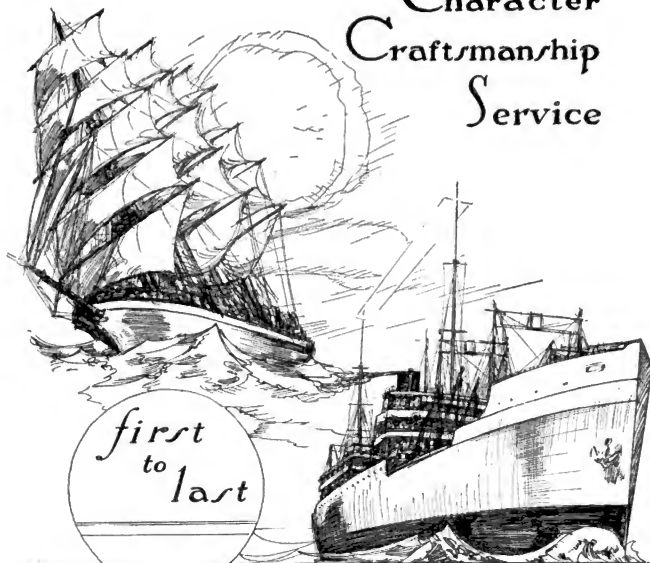
Particularly is this true in the matter of the 1916 naval program. In that program vessels to cost some hundreds of millions were authorized by Congress and contracted for in good faith by the Bureau of Construction and Repair of the Navy Department.

These ships have practically all been laid down in the shipyards or navy yards, material has been ordered for them, some ships have been delivered, more are in various stages of completion. The shipyards and navy yards have executed contracts with hundreds of subcontractors in various parts of the country for machinery and material, fittings and equipment, for these vessels, the aggregate involving the work of many thousands of skilled artisans, and now on a plea of economy this work is all in a state of suspense for an indefinite period of delay.

If there were any real economy to be gained by such action, there might possibly be justification, but it is so obvious that delay of this sort will tremendously increase the final cost of these vessels, and the laying off of thousands of additional men consequent on the delay will so obviously increase the general depression, that this action seems not only uneconomical but from a business point of view extremely penny wise and pound foolish if not absolutely senile.

All of the business interests of the industrial and marine centers in the United States should join in a protest to Congress against this action and in a demand for a deficiency appropriation to continue with the work in hand. This should be done entirely on an economic basis and apart altogether from the question of the disarmament conference.

Character Craftsmanship Service



From the sailing ship of earlier days to the specialized, oil-burning, steel cargo-carrier of today; through all its ups and downs to its present outstanding position, the American Merchant Marine has fostered and will maintain those traditions which enrich the history of sea transportation.

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These ideals have been steadfastly maintained; and upon the foundation of complete plant facilities and modern steel-working practice there has grown up a tradition of accomplishment in the building of good ships—ships that proudly take leadership in the greater American Merchant Marine that reflect New York Ship's

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THE ARGOES OF THE ARGONAUTS

FEW Californians realize the importance of California of the harbor of San Francisco, and perhaps this can be brought home to the minds of Californians more forcibly than in any other way by a presentation of the conditions existing in San Francisco Bay itself at the time of the admission of California into the United States. In order to show this condition we are printing herewith a list of the ships in the harbor on September 9, 1850.

This list was furnished us through the courtesy of Mr. F. C. Matthews. Mr. Matthews is a San Franciscan who has been intimately connected with work in the harbor for forty-five years. As a boy he watched with delight the stately clipper ships sailing in through the Golden Gate. Falling in love with these "white-winged darlings of the sea," he made it his hobby to study the history of the sailing ships of the Pacific. The list as prepared by him and as printed below represents

a tremendous amount of painstaking research, to which Mr. Matthews devoted much of his spare time for many years.

This list has never been published before in so complete a form. Between the lines our readers will be able to discern much of the adventure, hardship, the brave forward-looking vision, which has built this great state into the place it holds in our American Commonwealth.

We wish to emphasize here the fact that there were in San Francisco harbor as early as September 9, 1850, upwards of 660 sea-going vessels representing the flags of practically every maritime country in the world.

Mr. Matthews promises the readers of Pacific Marine Review in future issues the intimate stories of some of these ships of the later and more famous extreme American clippers of the early fifties.

Vessels in San Francisco Bay September 9th, 1850

NAME	Flag	Rig	Tonnage	Date of Arrival	NAME	Flag	Rig	Tonnage	Date of Arrival
Abagun	Am.	Bk.	330	July 30, '50	Arco Iris	Am.	Bk.	253	Aug. 22, '50
Abby Baker	Am.	Bk.	257	July 24, '50	Ariadne	Hambg.	Bg.	178	Aug. 23, '50
Acadian	Am.	Bg.	157	Oct. 29, '49	Arkansas	Am.	Sh.	627	Dec. 20, '49
Acadian	Br.	Bg.	368	June 17, '50	Arno	Am.	Sc.		June 20, '50
Ada	Br.	Bg.	390	Apr. 7, '50	Artemisia	Br.	Bk.	558	Aug. 5, '50
Adario	Am.	Bk.	268	May 9, '50	Astoria	Am.	Sc.		Sept. 2, '50
Adelaide	Am.	Bg.	178	May 5, '50	Athol	Br.	Bk.	337	Aug. 13, '50
Adeline	Am.	Sc.	85	June 23, '50	Attila	Am.	Bg.	206	May 10, '50
Adeline	Dan.	Bg.	111	June 25, '50	Audley Clark	Am.	Sh.	331	Sept. 1, '49
Adirondack	Am.	Sh.	699	Aug. 1, '50	Augustus	Br.	Bk.		Sept. 9, '50
Adventure	Br.	Sc.	102	Sept. 5, '50	Abon	Am.	Sc.	123	Aug. 8, '50
A. Emery	Am.	Sc.	98	Sept. 6, '49	Balance	Am.	Sh.	321	Nov. 23, '49
Agate	Am.	Bg.	194	Apr. 25, '50	Barbara	Br.	Bk.	460	July —, '50
Agincourt	Br.	Sh.	669	July 30, '50	Bay State	Am.	Sc.	70	Aug. 14, '50
Agnes	Am.	Bk.	206	May 10, '50	Bazaar	Am.	Sh.	452	Feb. —, '50
A. Hayford	Am.	Bg.	187	Aug. 23, '50	Bee	Br.	Bg.	134	Apr. 10, '50
Albree	Am.	Bg.	378	May 3, '50	Belgrade	Am.	Bk.	252	May 28, '50
Alexander	Am.	Sh.	398	June 2, '50	Bella Pernambuco	Port.	Bk.	217	June 13, '50
Alexander	Am.	Sc.	69	May 6, '50	Belvedere	Am.	Bk.	390	Oct. 12, '49
Alexandrine	Am.	Sh.	491	July 30, '50	Bingham	Am.	Sh.	375	Nov. 4, '49
Algoma	Am.	Bk.	293	June 19, '50	Birmingham	Am.	Sh.	570	Apr. 7, '50
Alhambra	Am.	Bg.	694	Oct. 12, '49	Blakely	Br.	Bk.	315	Sept. 2, '50
Alice	Chile	Bg.	120	Dec. 27, '49	B. M. Prescott	Am.	Bg.	138	May 18, '50
Alice Tarleton	Am.	B.	360	Aug. 10, '50	Bolton	Am.	Bk.	220	Dec. 15, '49
Almena	Am.	Bg.	175	July 18, '49	Bordeaux	Am.	Bg.	370	Sept. 6, '50
Almendraлина	Chile	B.	200	Oct. 12, '49	Bostonian	Am.	Bk.	370	Aug. 10, '50
Almira	Am.	Bg.	197	Sept. 5, '50	Brazilian	Br.	Bg.	168	Apr. 8, '50
Alpha	Am.	Sh.	514	Aug. 2, '50	Brillante	Span.	Bg.	378	Aug. 8, '50
Amelia	Am.	Bg.	136	May 6, '50	Broadaxe	Br.	Bg.	150	Aug. 22, '50
Amelia	Br.	Bg.	149	May 6, '50	Brontes	Am.	Bk.	369	Aug. 2, '50
America	Am.	Bk.	314	July 30, '50	Brothers	Am.	Bg.	298	Aug. 19, '50
America	Am.	Bk.	178	May 29, '50	Burnham	Am.	Rg.	200	July 30, '50
America	Hambg.	Bk.	220	July 25, '50	Burnham	Am.	Sh.	337	Jan. 3, '50
Amity	Am.	Sh.	550	Aug. 15, '50	Burlington	Am.	Sh.	535	June 28, '50
Amizade	Port.	Bg.	250	Aug. 22, '50	Burnham	Am.	Bk.	350	Mch. 10, '50
Andrew Scott	Am.	Sh.	318	May 9, '50	Byron	Am.	Bk.	346	July 12, '50
Anenome	Br.	Bg.	230	July 6, '50	Byron	Am.	Sh.	492	—, '49
Anita	U. S.	Bk.	194	June 27, '50	Cachalet	Am.	Bk.	230	July 1, '50
Ann A. Knowles	Am.	Sc.	120	Aug. 11, '50	Caleb Curtis	Am.	Bg.		Sept. 8, '50
Ann Mary Ann	Am.	Sh.	380	May 1, '50	Cadmus	Am.	Bk.	306	Aug. 24, '50
Ann Parry	Am.	Bk.	348	Dec. 31, '49	Caledonia	Am.	Sh.	445	June 15, '50
Anne	Am.	Bk.	222	Aug. 29, '49	California	Am.	Bk.	369	Mch. 8, '50
Annie E. Maine	Am.	Sc.		Mch. 7, '50	California	Am.	Sc.	72	Mch. 8, '50
Anson	Am.	Sh.	300	July 30, '50	California Packet	Am.	Sh.	602	Aug. 24, '50
Antares	Am.	Bg.	199	Feb. 22, '50	Callao	Am.	Bg.	166	Aug. 1, '49
Antelope	Swed.	Bk.	400	July 29, '50	Calumet	Am.	Sh.	317	Feb. 26, '50
Antelope	Br.	Stmr.	597	Aug. 3, '49	Camargo	Am.	Bg.	199	Jan. 9, '50
Apollo	Am.	Sh.	412	Sept. 18, '49	Camilla	Br.	Bg.	202	Aug. 13, '50
Arabia	Br.	Bg.	91	Aug. 10, '50	Camilla	Mex.	Sh.	325	July —, '50
Arabian	Am.	Bg.	169	Aug. 26, '50	Cantero	Am.	Bk.	266	Apr. 29, '50
Archibald Gracie	Am.	Bk.	200	July 18, '50					

NAME	Flag	Rig	Tonnage	Date of Arrival	NAME	Flag	Rig	Tonnage	Date of Arrival
Carl & Herman	Hambg.	Sh.	600	Aug. 5, '50	Dudley	Am.	Bk.	249	May 1, '50
Carnival du Cheverus	Fr.	Bk.	316	July —, '50	Dumbarton	Am.	Sh.	499	Aug. 30, '50
Caroline Augusta	Am.	Sh.	406	June 26, '50	E. A. Slicer	Am.	Sc.	56	June 23, '50
Caroline Clark	Am.	Bg.	162	June 14, '50	Eagle	Am.	Bg.	190	Sept. 9, '50
Carthage	Br.	Bk.	443	July 30, '50	Eagle	Am.	Bg.	190	June 23, '50
Castilla	Am.	Bg.	161	Aug. 29, '50	Eclipse	Br.	Bg.	191	July 28, '50
Castilla	Chile.	Bk.	205	July 7, '49	Ecuador	Br.	Stmr.	221	Aug. 23, '50
Catharine	Am.	Bk.	237	Feb. 21, '50	Edgar	Am.	Sh.	420	Aug. 10, '50
Catharine	Am.	Sh.	478	Aug. 2, '50	Edinburgh	Am.	Bg.	179	Aug. 30, '50
Cayuga	Am.	Bg.	237	June 16, '50	Edward	Am.	Sh.	350	Dec. 13, '49
Cecil	Am.	Sc.	90	Aug. 13, '50	Edwin	Am.	Bk.	239	May 4, '49
Centinella	Chile.	Bg.	160	July 7, '49	Eleanor	Am.	Sh.	280	Mch. 30, '50
Ceres	Am.	Bg.	290	July 28, '50	Elida	Nor.	Bk.	280	June 2, '49
Ceres	Fr.	Sh.	323	Dec. 15, '49	Eliza	Am.	Bk.	240	June 2, '49
Ceylon	Am.	Bg.	196	June 30, '50	Eliza	Br.	Sc.	33	Apr. 7, '50
Chariot	Am.	Sh.	359	Feb. 21, '50	Eliza Adams	Am.	Sh.	408	Jan. 28, '50
Charles Carroll	Am.	Sh.	411	Dec. 6, '49	Eliza Taylor	Am.	Bg.	134	Aug. 3, '50
Charles Herbert	Am.	Sc.	67	June 29, '50	Eliza Warwick	Am.	Sh.	530	July 25, '50
Charlotte	Am.	Bg.	170	July 24, '49	Elizabeth	Am.	Sh.	397	Sept. 17, '49
Charlotte	Am.	Sh.	390	June 22, '50	Elizabeth	Am.	Bk.	—	Sept. 7, '50
Chase	Am.	Bk.	152	—, '49	Elizabeth	Am.	Sc.	176	Apr. 7, '50
Chateaubriand	Fr.	Sh.	567	Feb. 22, '50	Elizabeth	Br.	Sc.	21	Feb. 10, '50
Chatham	Am.	Bg.	171	Nov. 1, '49	Elizabeth B.	Am.	Sc.	98	May 6, '50
Cheslea Smith	Am.	Sloop	11	May 31, '50	Ella Frances	Am.	Bk.	328	Dec. 15, '49
Chenango	Am.	Bk.	361	Aug. 7, '50	Ellen Brooks	Am.	Sh.	464	June 16, '50
Chesapeake	Am.	S. S.	392	Aug. 7, '50	Emily	Am.	Sh.	301	July 31, '50
Chesapeake	Am.	Sc.	99	Feb. 1, '50	Emma	Am.	Bg.	150	Jan. 9, '50
Cheshire	Am.	Sh.	499	June 17, '50	Emma Prescott	Am.	Bg.	185	May 23, '50
Chilo	Am.	Bg.	420	Aug. 21, '50	Emma Skerrett	Br.	Bg.	—	Sept. 9, '50
Christiana	Am.	Bg.	226	Mar. —, '50	Emperor	Am.	Sc.	110	July 8, '50
Christiana	Am.	Bk.	620	Aug. 27, '50	Empire	Am.	Sc.	79	June 2, '50
Circassian	Br.	Bk.	219	Aug. 4, '50	England	Br.	Sh.	724	July —, '50
Citizen	Am.	Sh.	464	Jan. 11, '50	E. Randall	Am.	Bg.	143	May 6, '50
Citizen	Am.	Sh.	360	June 6, '50	Esperanza	Hav.	Bk.	360	July 30, '50
Clarissa Andrews	Am.	Sh.	396	Aug. 12, '50	Eudoras	Am.	Sc.	144	Sept. 15, '49
Clarissa Perkins	Am.	Sh.	240	Aug. 22, '50	Eugene	Am.	Sc.	161	Apr. 22, '50
Clyde	Br.	Sc.	40	Oct. 23, '49	Eureka	Am.	Bk.	372	June 17, '50
Cohota	Am.	Sh.	603	Aug. 13, '50	Eureka	Am.	Bk.	318	Aug. 3, '50
Col. Fanning	Am.	Sc.	138	May 18, '50	Eureka	Am.	Bk.	277	Aug. 23, '50
Colorado	Am.	Bg.	199	June 15, '50	Europe	Am.	Sh.	557	Feb. 8, '50
Columbia	Am.	Bg.	156	Aug. 24, '50	Excel	Am.	Sc.	81	July 29, '50
Columbus	Am.	Sh.	344	Apr. 30, '50	Ezpeleta	Am.	Bk.	180	May 6, '50
Condor	Ec.	Bg.	84	July —, '50	Fabius	Am.	Bg.	188	Aug. 6, '50
Confederacion	Chile.	Bk.	331	Feb. —, '49	Falmouth	Am.	Sc.	97	Aug. 12, '50
Congress	Am.	Bk.	273	June 16, '50	Fame	Am.	Sc.	95	Aug. 4, '50
Constance	Am.	Bk.	390	Aug. 10, '50	Fame	Br.	Bk.	202	Mch. —, '50
Constant	Br.	Bk.	535	Aug. 17, '50	Fanny	Am.	Sh.	860	Aug. 5, '50
Constellation	Am.	Sh.	276	June 13, '50	Fanny	Br.	Bg.	260	June 28, '50
Coosa	Am.	Bk.	258	Mch. 10, '50	Far West	Am.	Sh.	598	Dec. 11, '49
Cordova	Am.	Sh.	332	Apr. 8, '50	Favorite	Am.	Sc.	38	July —, '50
Corea	Am.	Sh.	375	Aug. 27, '50	Fawn	Am.	Bg.	—	Sept. 8, '50
Cornelia	Am.	Bg.	96	July 19, '50	Payaway	Am.	Sc.	77	June 5, '50
Correo del Pacifico	Chile.	Bg.	127	Sept. 8, '50	Felix Araucano	Chile.	Bg.	103	—, '49
Correo del Talcahuano	Chile.	Bg.	104	Mch. —, '49	Felix Carolina	Chile.	Sc.	86	Mch. —, '50
Correo del Valparaiso	Hwn.	Bg.	120	—, '49	Flinders	Br.	Sc.	18	Aug. 13, '50
Corvo	Am.	Sh.	340	July 31, '50	Flora	Am.	Bk.	338	Dec. 20, '49
Creole	Am.	Sc.	142	June 23, '50	Flora	Hambg.	Bg.	137	Aug. 4, '50
Crescent	Am.	Sh.	340	May 27, '50	Florence	Am.	Sh.	360	Aug. 26, '49
Crocus	Am.	Bg.	221	June 23, '50	Florida	Am.	Bk.	200	Aug. 15, '50
Cuba	Am.	Bk.	240	Sept. 6, '50	Frances Ann	Am.	Sh.	446	Nov. 1, '49
Curacao	Am.	Bg.	131	Aug. 14, '50	Frances Helen	Am.	Sc.	95	Aug. 21, '50
Curtis	Am.	Bk.	249	Mch. 8, '50	Franklin Adams	Am.	Bg.	198	Apr. 28, '50
Cynosure	Am.	Sc.	—	Sept. 5, '50	Frederick Warren	Am.	Bk.	353	Aug. 10, '50
Cyrus	Am.	Bk.	247	Feb. 6, '50	Friendship	Am.	Sh.	366	Feb. 22, '50
Dalmatia	Am.	Sh.	358	Aug. 27, '50	Galen	Am.	Bg.	226	May 29, '50
Damariscove	Am.	Sc.	102	July 12, '50	Ganges	Am.	Bg.	244	June 14, '50
Delaware	Am.	Bk.	290	Aug. 16, '50	Garnet	Am.	Bg.	194	Apr. 29, '50
Delahos	Am.	Bk.	—	Sept. 9, '50	Gazelle	Br.	Bg.	285	Apr. 18, '50
Detroit	Am.	Bg.	—	Sept. 4, '50	General Green	Am.	Bk.	242	July 25, '50
Diadem	Am.	Sh.	657	June 28, '50	General Harrison	Am.	Sh.	409	Feb. 3, '50
Diana	Peru.	Bk.	168	June 25, '50	General Morgan	Am.	Sc.	138	Sept. 6, '50
Dianthe	Am.	Bk.	284	June 23, '50	General Scott	Am.	Bg.	236	July 21, '50
Dispatch	Br.	Bg.	139	July 30, '50	General Worth	Am.	Sc.	173	Oct. 15, '49
Dimond	Am.	Bk.	199	Mch. —, '50	George Henry	Am.	Bk.	—	Sept. 3, '50
Don Juan	Am.	Bk.	254	June 6, '50	George Ryan	Am.	Bg.	212	May 7, '50
Dos Amigos	Mex.	Sc.	97	June 17, '50	George Shattuck	Am.	Bg.	210	May 7, '50
Dos Hermanos	Ec.	Bk.	220	Mch. —, '50	George Washington	Am.	Sc.	131	May 28, '50
Dover	Am.	Bg.	167	Aug. 20, '50					

NAME	Flag	Rig	Tonnage	Date of Arrival	NAME	Flag	Rig	Tonnage	Date of Arrival
Georges	Fr.	Sh.	424	June 5, '50	John Allyne	Am.	Sc.	92	Aug. 15, '50
Georgia	Am.	Bk.	360	Aug. 6, '50	John Bull	Br.	Sc.	71	May 6, '50
Georgiana	Br.	Sloop	25	Feb. 13, '50	John Calvin	Br.	Bk.	510	Aug. 4, '50
G. H. Montague	Am.	Sc.	167	Mch. 1, '50	John Clifford	Am.	Bg.	161	Aug. 26, '50
Gipsey	Am.	Bk.	470	Aug. 23, '50	John Dunlap	Am.	Sc.	105	May 2, '49
Glencoe	Am.	Bg.	229	June 3, '50	John G. Colley	Am.	Bk.	282	June 17, '50
Globe	Am.	Sh.	317	Nov. 2, '49	John Jay	Am.	Sh.	494	Aug. 29, '50
Gloucester	Br.	Bk.	297	May 28, '50	John Munn	Br.	Bk.	639	Aug. 29, '50
Cold Hunter	Am.	Sh.	281	June 2, '50	John Story	Am.	Sc.	90	Aug. 1, '50
Goodwin	Am.	Sh.	595	Aug. 16, '50	John W. Cater	Am.	Bg.	217	May 6, '50
Grotius	Am.	Sh.	299	Mch. 1, '50	Joseph Fish	Am.	Bk.	250	Aug. 3, '50
Gulnare	Am.	Bg.	195	May 14, '50	Josephine	Am.	Sc.	120	July 18, '50
Gustave	Hambg.	Bg.	141	Aug. 1, '50	Josephine	Am.	Sh.	480	July 28, '50
G. W. Kendall	Am.	Bg.	183	Aug. 23, '50	Josephine	Br.	Sc.	50	Aug. 4, '50
Hamilton	Am.	Bk.	322	Mch. 15, '50	Josephine	Am.	Bk.	148	Aug. 1, '50
Hardy	Am.	Bg.	280	July 19, '50	Joven Adonis	Peru.	Bk.	250	May 28, '50
Harmony	Br.	Sh.	529	July 2, '50	J. S. Cabot	Am.	Sc.	180	Aug. 11, '50
Harriet	Am.	Sc.	128	June 5, '50	Julia	Chile.	Bg.	120	Mch. 1, '50
Harriet Atwood	Am.	Sc.	73	Aug. 10, '50	Juliet	Am.	Sc.	120	Aug. 24, '50
Harriet Rockwell	Am.	Sh.	470	Feb. 26, '50	Julius Pringle	Am.	Sc.	97	Aug. 10, '50
Harriet Thompson	Am.	Bk.	239	Jan. 14, '50	Jupiter	Am.	Sc.	97	June 21, '50
Harvard	Am.	Bg.	492	Aug. 4, '50	J. W. Brown	Am.	Sc.	100	Sept. 3, '50
Harvest	Am.	Bk.	294	May 29, '50	Kate Heath	Am.	Bg.	188	May 5, '50
Henrietta Wilhelmina	Holl.	Bg.	100	June 25, '50	Kauai	Hw.	Sc.	16	July 2, '49
Henry	Am.	Sh.	434	May 16, '50	Keku Lanoi	Hw.	Sc.	42	Mch. 1, '50
Henry	Am.	Bg.	153	Aug. 1, '50	Kensington	Am.	Sh.	494	July 24, '50
Henry Ewbank	Am.	Bk.	330	Dec. 27, '49	Keoka	Am.	Bk.	247	Aug. 20, '50
Henry Harbeck	Am.	Bk.	400	July 1, '50	Keona Ana	Hw.	Bg.	200	Aug. 27, '50
Henry Kelsey	Am.	Bk.	197	July 28, '50	Kilby	Am.	Bk.	478	Aug. 14, '50
Henry Lee	Am.	Sh.	409	Sept. 13, '49	Kingsbury	Am.	Bg.	198	Aug. 3, '50
Henry Pratt	Am.	Sh.	600	July 18, '50	Kirkwood	Am.	Bk.	280	Aug. 23, '50
Henry Tuke	Am.	Sh.	365	July 15, '50	Knickerbocker	Hambg.	Sh.	344	Nov. 2, '49
Henry Von Gagen	Holl.	Bk.	300	Aug. 15, '50	Komet	Holl.	Bg.	150	Aug. 27, '50
Herald	Am.	Bg.	162	Mch. 1, '50	Lady Adams	Br.	Sh.	274	Aug. 28, '49
Herbert	Am.	Sh.	586	Sept. 8, '50	Lady Shaw Stewart	Br.	Bg.	181	Jan. 14, '50
Hercule	Fr.	Sh.	224	June 8, '50	La Grange	Am.	Bk.	270	Sept. 17, '49
Hercules	Am.	Sh.	371	Aug. 3, '50	Lalla	Br.	Bg.	177	Dec. 12, '49
Hiram	Russ.	Bk.	316	May 1, '50	Lambert Suydam	Am.	Sc.	161	June 11, '50
Hibernia	Am.	Sh.	551	June 17, '50	La Soledad	Gren.	Bg.	100	Aug. 4, '49
Hedgdon	Am.	Bg.	198	Mch. 1, '50	Laura	Br.	Bk.	329	July 28, '50
Hope	Am.	Bk.	186	Aug. 23, '50	Laura Snow	Am.	Bk.	293	June 13, '50
Horatio	Am.	Bk.	242	Mch. 1, '50	Lawsons	Br.	Bg.	265	Aug. 3, '50
Hortensia	Am.	Bk.	293	Aug. 1, '50	Le Baron	Am.	Bk.	169	Aug. 16, '50
Houqua	Am.	Sh.	582	July 23, '50	Leo	Am.	Bg.	136	May 6, '50
Hugh Walker	Br.	Sh.	496	July 23, '50	Leveret	Am.	Bg.	100	Aug. 16, '50
Huron	Am.	Sh.	290	Mch. 1, '50	Linda	Am.	Bk.	245	Sept. 25, '49
Ilzaide	Am.	Sh.	418	July 28, '50	Lindsays	Am.	Bk.	217	June 18, '49
Imaum of Muscat	Br.	Sh.	.....	Sept. 6, '50	Lion	Am.	Bg.	235	Aug. 14, '50
Independence	Am.	Bg.	261	Aug. 13, '50	L'Italiano	Chile.	Bg.	120	Aug. 10, '50
Indianeran	Holl.	Bk.	300	Aug. 22, '50	Lord Hobart	Br.	Bg.	160	Apr. 24, '50
Inez	Am.	Sh.	356	.....	Louisa	Am.	Bg.	590	July 18, '50
Invincible	U. S.	Sc.	133	Aug. 5, '50	Louisa Bliss	Am.	Bk.	359	Aug. 28, '50
Iowa	Am.	Bk.	874	June 17, '50	Louise Marie	Fr.	Bk.	190	Dec. 15, '49
Itaska	Am.	Bk.	242	July 20, '50	Lowell	Am.	Sh.	414	July 26, '50
Iwanoena	Am.	Bk.	254	July 24, '50	Lowell	Am.	Bg.	240	Aug. 4, '50
Izotte	Am.	Bk.	275	June 15, '50	Lydia	Am.	Sc.	60	July 13, '50
J. A. Burr	Am.	Sloop	52	July 29, '50	Lydia Ann	Am.	Bk.	198	Aug. 12, '50
J. A. Jessure	Am.	Bk.	203	July 31, '50	Macedonia	Am.	Sh.	414	Aug. 14, '50
Jacob M. Ryerson	Am.	Sc.	177	June 27, '50	Madonna	Am.	Bk.	270	July 1, '49
Jacob S. Waln	Am.	Bk.	214	Jan. 12, '50	Madonna	Am.	Bk.	498	Jan. 25, '50
James	Br.	Bk.	195	Aug. 26, '50	Magdala	Am.	Bk.	298	Dec. 10, '49
James B. Lippincott	Am.	Sc.	115	June 6, '50	Magnolia	Am.	Sh.	386	Apr. 12, '50
James Caskie	Am.	Bg.	283	May 1, '50	Magnolia	Am.	Bk.	258	Feb. 26, '50
James Franklin	Am.	Sc.	78	Aug. 20, '50	Managua	Br.	Bg.	151	May 5, '50
James R. Whiting	Am.	Sc.	137	Aug. 23, '50	Manchester	Am.	Sh.	507	June 17, '50
James Stewart	Br.	Sh.	386	Aug. 15, '50	Manco	Am.	Sh.	350	May 1, '50
Jane	Am.	Bg.	168	June 7, '50	Manuela Pierra	Chile.	Sc.	90	Mch. 1, '50
Jane	Am.	Bk.	198	Mch. 1, '50	Marathon	Am.	Sh.	382	Aug. 26, '50
Jane A. Hersey	Br.	Bg.	136	Mch. 1, '50	Marcellus	Am.	Sh.	659	July 29, '50
Jane Frances	Am.	Bk.	391	Aug. 26, '50	Marcia Cleaves	Am.	Sh.	436	May 16, '50
Jane Henderson	Am.	Sh.	637	Aug. 13, '50	Margaret	Am.	Bg.	246	May 28, '50
Jane Tudor	Br.	Bk.	445	Aug. 27, '50	Maria Victoria	Peru.	Bg.	140	Oct. 6, '49
Janet	Br.	Bk.	333	Mch. 1, '49	Martha	Am.	Sh.	273	Apr. 2, '50
J. C. Demarest	Am.	Sc.	60	June 30, '50	Martha	Am.	Sh.	533	June 8, '50
Jane Lucie	Fr.	Bg.	.....	May 28, '50	Martha W. Brett	Am.	Bk.	228	Mch. 15, '50
Johannes Sarkies	Br.	Bk.	454	June 17, '50	Mary A. Jones	Am.	Bg.	190	July 28, '50
John Adams	Am.	Bk.	380	July 10, '50	Mary Ann Folliott	Br.	Sh.	408	Aug. 4, '50

NAME	Flag	Rig	Tonnage	Date of Arrival	NAME	Flag	Rig	Tonnage	Date of Arrival
Mary Ellen	Am.	Bg.	160	July 30, '50	Philomena	Am.	Bk.		Sept. 9, '50
Mary Frances	Hwn.	Bk.	230	Oct. 1, '49	Phoenix	Am.	Sh.	314	Aug. 5, '50
Mary Reed	Am.	Sc.	103	Aug. 8, '50	Pianet	Am.	Bg.	119	May 14, '50
Mary Waterman	Am.	Bk.	240	May 14, '50	Pico	Am.	Bk.	215	June 18, '50
Mary and Emma	Am.	Sc.	58	Aug. 10, '50	Pilgrim	Am.	Sc.	98	Aug. 5, '50
Mary and Jane	Am.	Bg.	198	Aug. 16, '50	Plato	Am.	Bg.	205	June 18, '50
Mary and Martha	Am.	Bk.	316	Mch. —, '50	Pleiades	Am.	Bk.	260	May —, '50
Mary and Phoebe	Am.	Bg.	148	Aug. 25, '50	Polka	Am.	Bk.	182	Aug. 6, '50
Masconomo	Am.	Sh.	824	July 20, '50	Pondichery	Fr.	Sh.	323	Aug. 10, '50
Massachusetts	Am.	Stmr.	353	June 8, '49	Pontrac	Am.	Sc.	69	Apr. 19, '50
Mattakeaset	Am.	Sh.	481	Apr. 24, '50	Popmunnet	Am.	Bk.	183	June 26, '50
Mayflower	Am.	Sh.	349	Sept. 13, '49	Portenia	Br.	Bg.	221	Aug. 8, '50
Mazagram	Fr.	Sh.	256	Aug. 13, '50	Portland	Am.	Bk.	287	Aug. 16, '50
McLellan	Am.	Bg.	364	Aug. 15, '50	Post Boy	Br.	Sc.	44	July 2, '50
Mentor	Am.	Sh.	460	June 30, '49	Powhattan	Am.	Sc.	556	July 29, '50
Merchant	Am.	Sh.	389	Aug. 26, '50	Powhattan	Am.	Bk.	220	—, '49
Merchantman	Am.	Bg.	234	July 24, '50	Primavera	Am.	Bg.	180	Aug. 13, '50
Meta	Am.	Bg.	208	Aug. 17, '50	Prospect	Br.	Bg.	200	July 29, '50
Meteor	Am.	Bg.	129	Sept. 1, '50	Providence	Am.	Sc.	72	July 29, '50
Metropolis	Am.	Bg.	208	May 15, '50	Providence	Am.	Sc.	61	Apr. —, '49
Mexican	Am.	Sc.	128	May 7, '50					
Minerva	Am.	Bk.	195	Mch. —, '50	Quadratus	Am.	Bg.	132	May 10, '50
Minerve	Fr.	Sh.	309	May 8, '50	Quito	Am.	Bg.	138	Feb. 19, '50
Monsoon	Am.	Sh.	380	Apr. 7, '50	Quoddy Belle	Am.	Bg.	147	May 7, '50
Montano	Am.	Sh.	365	Nov. 27, '49					
Montgomery	Am.	Bk.	247	Aug. 15, '50	Rachel Stevens	Am.	Bg.	213	Aug. 26, '50
Monument	Am.	Sh.	499	May 9, '50	Ralph Thompson	Br.	Bk.	385	Aug. 5, '50
Morgan Dix	Am.	Bk.	180	July 19, '50	Rambler	Am.	Sc.	50	July —, '49
Morrison	Am.	Sh.	565	Sept. 20, '49	Raritan	Am.	Sh.	494	July 28, '50
Mount Vernon	Am.	Sc.	74	Apr. 22, '50	Raymond	Br.	Bk.	498	July 19, '50
Mousam	Am.	Bk.	220	Aug. 5, '50	R. B. Potter	Am.	Sc.	120	Aug. 6, '50
					Regia	Br.	Bg.	181	Aug. 23, '50
Nathaniel Hooper	Am.	Sh.	427	Feb. 4, '50	Regulus	Am.	Sh.	387	Sept. 30, '49
Nestor	Am.	Sh.	396	June 6, '50	Reindeer	Am.	Bg.	136	Aug. 4, '50
New England	Am.	Bk.	238	May 8, '50	Reindeer	Am.	Bg.	161	Aug. 27, '50
New World	Am.	Stmr.	650	July 11, '50	Resolutie	No. Ger.	Sh.	374	Sept. 25, '49
Niagara	Am.	Bk.	232	Aug. 27, '50	Rhine	Am.	Bk.	174	July —, '50
Niantic	Am.	Sh.	451	July 5, '49	Rhodes	Am.	Bk.	479	June 14, '50
Nile	Am.	Bk.	180	Mch. —, '50	Ricardo	Peru.	Bg.	100	Oct. 12, '49
Ninfa	Ec.	Sloop	17	—, '49	Richard Towle	Prus.	Bk.		Sept. 5, '49
Ninus	Am.	Bk.	255	May 19, '50	Rio Grande	Am.	Bk.	298	Feb. 21, '50
Noble	Br.	Bk.	251	June 25, '50	Rival	Am.	Bk.	214	June 16, '50
Nonpareil	Am.	Bg.	137	June 25, '50	River Chief	Br.	Bg.	150	July 2, '50
North Bend	Am.	Bg.	176	July 9, '49	Rob Roy	Am.	Sh.	530	Aug. 8, '50
North Carolina	Am.	Sh.	669	June 14, '50	Robert	Am.	Bg.	146	July 20, '50
N. S. de Doris	Port.	Bk.	300	Aug. 13, '50	Robert Browne	Am.	Sh.	502	Aug. 29, '49
					Robert Bruce	Am.	Bg.	114	July 30, '50
Obed Mitchell	Am.	Sh.	355	Sept. 17, '49	Robert Henderson	Br.	Bk.	368	June 23, '50
Oberlin	Am.	Bk.	330	May 6, '50	Robert Succouf	Fr.	Sh.	324	Aug. 13, '50
Ocean	Br.	Bg.	176	Dec. 29, '49	Rodolph	Am.	Sc.	123	Sept. 8, '50
Oceanic	Fr.	Bk.	205	Aug. 5, '50	Rolla	Am.	Bk.	309	July 17, '49
Odd Fellow	Am.	Sc.	120	Aug. 4, '50	Rome	Am.	Sh.	344	Feb. 28, '50
Olive Branch	Am.	Sh.	336	Jan. 25, '50	Rose Standish	Am.	Sh.	940	Aug. 5, '50
Oneco	Am.	Sh.	640	June 24, '50	Rosetta Joseph	Br.	Bk.	264	Aug. 17, '50
Oniota	Am.	Bg.	209	Apr. 30, '50	Rostan	Ital.	Bg.	180	July 22, '50
Orator	Br.	Bk.	442	May 31, '50	Rowland	Am.	Bk.	400	July 31, '50
Orb	Am.	Bk.	230	Sept. 9, '49	Ruby	Am.	Sc.	127	May 7, '50
Oregon	Am.	Bk.	325	Aug. 29, '50	Russell	Am.	Bk.	301	July —, '50
Oriental	Am.	Bk.	480	July 31, '50	Russell	Am.	Sh.	348	Mch. —, '50
Orion	Am.	Bk.	449	May 6, '50	Ruth	Am.	Bg.	146	Mch. —, '50
Ortolan	Am.	Sc.	74	Aug. 6, '50					
Oscar	Am.	Bk.	369	Mch. —, '50	Sabina	Am.	Sh.	417	Aug. 9, '49
Osceola	Am.	Sh.	549	June 15, '50	Sacramento	Am.	Sc.	140	Aug. 24, '50
Othello	Am.	Sh.	370	Nov. 13, '50	Sacramento	Am.	Bk.	368	Sept. 9, '50
					Saint Andrew	Br.	Lorcha	48	May 13, '50
Packet	Br.	Bg.	188	July 23, '50	Saint James	Am.	Rk.	335	Aug. 30, '50
Page	Am.	Sc.	160	Aug. 6, '50	Saint Lawrence	Am.	Sh.	356	June 7, '50
Palladium	Am.	Bk.	341	Jan. 9, '50	Salem	Am.	Sh.	480	Oct. 12, '49
Palmetto	Am.	Bk.	282	Aug. 22, '50	Sam and Ben	Am.	Bg.	182	May 15, '50
Palmyra	Br.	Bg.	145	June 19, '50	Samuel French	Am.	Bg.	188	Apr. 25, '50
Panama	Br.	Bk.	300	Sept. 9, '50	San Francisco	Am.	Bk.	268	Jan. 12, '50
Panama	Am.	Sh.	508	Aug. 8, '49	San Jacinto	Am.	Bk.	185	May 6, '50
Patagonia	Br.	Bg.	230	Aug. 11, '50	Santiago	Am.	Sc.	99	June 17, '50
Paul	Fr.	Bk.	201	Sept. 30, '49	Sarah	Am.	Bk.	286	Mch. 14, '50
Pauline	Am.	Bg.	149	Sept. 1, '49	Sarah	Br.	Sh.	398	Aug. —, '50
Pembroke	Am.	Bk.	199	Apr. 2, '50	Sarah Boyd	Am.	Bk.	360	Aug. 15, '50
Perfect	Am.	Bg.	156	Apr. 7, '50	Sarah Hooper	Am.	Bk.	220	Aug. 3, '50
Perseverance	Chile.	Bg.	168	May 27, '49	Sarah Lavinia	Am.	Sc.	164	May 24, '50
Peru	Am.	Bk.	220	Sept. 2, '50	Sarah Parker	Am.	Sh.	387	Jan. 14, '50
Philip Hone	Am.	Sh.	291	Aug. 11, '49					

(Continued on page 524)

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PACIFIC COAST FISHERIES

California, the Premier Fishing State—I.

UNDOUBTEDLY the most important body of water from the standpoint of the fisheries of the world is the North Pacific Ocean. For untold centuries the coasts of Japan and of North China have furnished millions of pounds of sea food annually to the teeming populations of Asia, and since the advent of Anglo-Saxon civilization on the Pacific Coast the fisheries of that region, including the whole western shore of North America from the tip of Lower California to Bering Strait, have constantly increased in the volume and market value of the catch until at the present time the annual American sardine, tuna and salmon fisheries of this coast are the most important in the United States.

While we know through tradition and the written record that the Indians of the Columbia River region in Oregon and Washington, of the Sacramento River region in California, and the various rivers of the Alaska peninsula have for long centuries taken advantage of the salmon runs on the rivers and prepared from their catches of fish much of the food that was necessary to tide them over the winter seasons, still modern commercial fishing in these waters may be said to date from the establishment of the first salmon cannery at Washington, Yolo county, California, in 1864.



Fishermen's Wharf, San Francisco, in 1921. Compare with picture below and note persistence of type in the fishing boats

Total Catch of Fish in California

1916—90,672,360 pounds	1919—259,713,573 pounds
1917—208,217,091 pounds	1920—213,847,807 pounds
1918—256,505,656 pounds	

Footnote: Out of the total catch in 1920, 78.6 per cent went to the canneries, 18.8 per cent was consumed fresh, and 2.6 per cent was shellfish, either canned or consumed fresh. These proportions illustrate very graphically the need for education of Californians as to the value of fresh fish in the daily food rations.



Fishermen's Wharf, San Francisco, in 1900, showing the old lateen sail rigs and the first unit of the present Fishermen's Lagoon
Reproduced from Christmas Number San Francisco News Letter 1901

First Fish Cannery

It is rather a singular coincidence that this first cannery should have been established through conditions due to the Civil War and that it should have been a floating cannery. We can only wonder whether the vision of Messrs. G. W. and William Hume and Andrew S. Hapgood, the founders of this original cannery, included the future world struggle which was to bring about commercial conditions that would place the fish canning industry of California at the top of the list for the United States and possibly for the entire world.

Prior to 1864 the Hume brothers had fished commercially for salmon in the Sacramento River, selling their catch fresh in the local markets. They were from the state of Maine and were in correspondence with Hapgood, who was engaged in canning lobsters in their home state. They induced him to go into partnership with them for the canning of salmon. He ordered and shipped the necessary machinery, coming with it around the Horn, while they purchased a large scow

larger market, was at San Francisco. The importance of these salt water fisheries and of the fisheries in the Sacramento and San Joaquin Rivers at an early date attracted the attention of the state government so that under the administration of Governor H. H. Haight the legislature of 1870 established a board of fish commissioners for the state of California who were to carry out the provisions of "an act to provide for the restoration and preservation of fish in the waters of the state." This date is important to bear in mind in connection with California fisheries on account of the fact that this was the first board of fish commissioners in the United States and antedates by one year the Federal Bureau of Fisheries. The work of the California board of fish commissioners has thus grown normally with the growth of the fishing industries, and the growth of the fishing industries is in no small degree due to the activities of the commission.

Fish Transplanting

In its very early history—in fact, in the year 1872—the commission made an attempt to import eastern and



The sardine and salmon cannery of the F. E. Booth Company at Monterey, said to be the largest fish cannery in the world

and built upon the scow an erection to house the machinery. The equipment was very primitive, and most of the work was done by hand. From this humble beginning the salmon canning industry on the Pacific Coast has grown to a point where many millions are invested in boats, nets, machinery, equipment, warehouses, etc., and thousands of men are annually employed.

California Fish Commission

The early commercial fishing in salt water was almost exclusively for the purpose of supplying fresh fish for local market consumption. The most important center, both on account of the large quantity and great variety of fish taken and also on account of the

middle western game fish into the waters of California. They fitted up a special aquarium car, loaded it with black bass, brook trout, salt water eels, lobsters, oysters, two varieties of perch, catfish, etc., but after leaving Omaha the car was involved in a train wreck, and all of the contents became a total loss.

Undiscouraged, they immediately sent an agent east, who obtained 40,000 shad from the Hudson River which were safely brought out and planted in the Sacramento at Tehama. To show the importance of this early transplanting of fish, it is only necessary to call attention to the fact that at the present time over a million and a half pounds of shad are taken annually in California waters. From the year 1871 constantly increas-

		Sardine Pack by Districts			
		1916	1917	1918	1919
San Francisco	3,113	140,126	892,026	1,362,518	1,104,776
Santa Cruz	32,375	6,147	559,265	5,141,869	7,342,699
Monterey	10,459,029	41,621,150	64,915,002	81,447,280	69,719,517
Los Angeles	2,592,370	52,615,300	78,077,612	54,600,194	28,182,847
San Diego	2,551,026	9,718,336	13,207,265	11,183,539	12,167,199
Miscellaneous	10,899	2,272	1,641	141,779	691
Total	15,648,812	104,103,331	157,652,811	153,877,179	118,517,729

ing work in transplantation has been carried out, many fish hatcheries have been established, and much beneficial control exercised over methods of fishing, limitation of seasons, and regulation of fishing streams.

Sardines

In the '80s commercial fishermen were impressed with the tremendous runs of large sardines, particularly in the vicinity of San Francisco Bay, and in 1890 the first sardine cannery in California was established at North Beach, San Francisco. The demand for sardines at that time was confined to small sizes, and these were hard to get, the sardine in the waters of Central California being usually caught in lengths of from ten to twelve inches. For commercial reasons, therefore, the San Francisco cannery was abandoned after about two years' operation. Its machinery was sold and shipped to San Pedro in Southern California, where smaller sardines could be more easily obtained.

This San Pedro cannery was operated on a small scale until about 1910, when its attention was attracted to tuna packing, and after some experiments this new

California Fish Round the Earth

It is difficult for those not expert in estimating fish quantities to visualize any such figure as 81,000,000 pounds of sardines. The total catch of sardines in California waters during the year 1919, which so far holds the banner for volume, was 153,877,179 pounds. In 1920 this dropped to 118,517,729 pounds. Taking the latter figure as a basis, let us do a little comparative figuring and see just what is represented by that weight of fish. The great majority of these fish of course are canned, and in that year the figures show that these sardines were put into 1,062,996 cases. These cases held 55,462,738 cans of sardines. These cans placed end to end would make a line of cans 4947 miles in length, and they would contain 463,055,924 fish. These fish placed end to end with the tail of one fish in the mouth of the other, it is estimated, would make a girdle of fish 61,192 miles in length, which would be long enough to encircle the entire earth twice at the equator and have enough left to make a frame around continental United States.



The Bolinder, a typical crude oil engine general purpose fishing boat and cannery tender

industry was launched and grew very rapidly. In 1911 20,000 cases of tuna were put up, partly at San Pedro and partly at San Diego. This delicious product (the "seachicken") very quickly made its way in the market, and by 1917 the pack exceeded 350,000 cases put up by twenty-one canneries.

Meanwhile in 1903 F. E. Booth of San Francisco began canning sardines at Monterey Bay. He put over a campaign to create a demand for the larger sized fish packed in one pound oval cans under the name of Monterey mackerel, later reverting to the true name of Monterey sardine. The industry at Monterey has grown steadily until today the largest establishment in the world exclusively devoted to the canning of fish is located at that point, together with a large number of other canning establishments, so that in 1919 81,447,280 pounds of sardines were required to supply the canneries of this district alone.

The tuna canners of Southern California also turned their attention to sardines, whose seasonal run follows close on that of the tuna, and today the sardine output of the southern canneries now equals that of Monterey Bay.

It will be noted from the annexed tables that the total catch of sardines in California waters grew from 15,000,000 in 1916 to 153,000,000 in 1919, an increase of 1000 per cent in four years. Like all the other canning industries in the world, this industry undoubtedly over-expanded during that period and is now settling down to a more normal basis. The opinion of all of the experts is that the California canned sardine is equal, if not superior, to the imported variety, and undoubtedly with judicious use of publicity in exploiting their product the sardine canners of California have before them a period of great prosperity. At any rate, the Californiac is here supplied with a new thrill in investigating the resources of his wonderful state, for this business of canning sardines has put California well out at the top of the list as the greatest fishery state in the Union.

Boats and Methods

The methods and the boats used by California fishermen are of great variety. Up to about 1903 or 1904 the lateen rigged, double ended sailboat of the Greek type brought here by Italian fishermen was almost universally used in salt water fishing around San Fran-



The inner lagoon at Fishermen's Wharf, San Francisco, showing the boat repairing plant and power boats equipped for salmon trolling

cisco Bay. In the Sacramento River fishing, which at that time was of great importance, boats of every kind and description were used, but largely the flat-bottomed, square-ended scow. With the advent of the gasoline engine the Italian fishermen were quick to seize the advantages given by a more ready access to market from the sea fishing grounds, and the majority of the double-ended boats were fitted up with motors of from 5 to 10 horsepower with little or no change to the structure of the boat except the introduction of stiffening timbers under the engine and in way of the tailshaft. When in 1910 to 1916 the canning industry began to place great demands upon the fishermen and commercial sea fishing became very profitable, almost every type of small boat was commandeered and rushed in to the work, but experience has shown that a slightly modified form of this Mediterranean double-ended fishing lugger is best adapted for practically all offshore work. This has been particularly true since the introduction of trolling for salmon, the high blunt-pointed stern of these boats allowing the fisherman to attend to his tiller and to an outrigger line on each side very handily.

Trolling

In salmon trolling two stout-poles, usually of bamboo or poled saplings, are lashed to the boat in such a way as to carry fishing lines from 10 to 12 feet outboard on either side. These poles are guyed to the bow of the boat and carry a short line, known as the pole line, which is snapped to the main fishing line and the slack of the main line carried over from this snap to the boat's stern. The main fishing lines are usually set for different depths on either side of the boat while prospecting to discover the location of a school of fish. The boat trolls along with its engine choked down at about two to four miles an hour. Practically all of the boats carry but one fisherman, and it can be readily seen that with any great breadth of stern to his boat this one man might have considerable trouble in managing his tiller and landing a fish at the same time. The strike of the salmon with this rig is detected by the rapid jerking of the pole tip. With the majority of the commercial fishermen there is no attempt made to play the fish, the line being pulled in hand over hand, the landing being commonly effected by a gaffhook, and the fish instantly killed by clubbing over the head.

Catch of Salmon in California Waters

1916—10,939,534 pounds	1919—13,145,727 pounds
1917—11,061,587 pounds	1920—11,133,819 pounds
1918—13,093,188 pounds	

Footnote: During the years represented in this table sea fishing of salmon by the trolling method has

grown in importance, while the river fisheries, which formerly represented the great bulk of the annual catch, have dwindled very rapidly. In 1920 less than 4,000,000 pounds were caught in the rivers of the state or about 35 per cent of the total.

Trawling

In fishing for market there has grown up quite a business with larger boats in deep-sea trawling, the boats following the schools of fish as they migrate up the coast and the fish being brought to market by fish carriers, to which they are transferred from the boats on the fishing grounds. This is in line with the best practice in the fisheries of Europe and of the Northeast Coast of America, and as the fish markets grow on the Pacific Coast this business will undoubtedly largely increase.

At the present time there are at San Francisco eight companies engaged in the trawling business, employing twenty-six boats as fishers and carriers. It has very recently been recognized by the majority of these companies that the method of employing independent carriers to bring their fish from the fishing grounds to market is uneconomical, and an association has been formed known as the Associated Trawling Company, five companies being now incorporated with that association. These five companies have eighteen fishing boats, eight of which are kept continuously on the fishing grounds. These boats are served by one carrier, and it has been found that by pooling the fish the profits to each company are very much better than with independent operation.

Fishing Boat Statistics

According to reports of the California Fish and Game Commission, there are listed with them as of December 31, 1920, a total of 2055 boats engaged in commercial fishing. These boats vary in length from 16 to 65 feet; 1906 of these boats are gas driven, 7 are steam driven, 36 are sail, 102 are row boats, and 4 are barges. The total value of these boats is \$5,050,432, and the value of nets and gear \$1,839,990.

In these fishing boats will be found very many different makes and types of gasoline engine, but the great majority will have engines built in California. In talking with many fishermen about their boats and the performance of the power plant, we find an almost universal desire to get some good, reliable, small crude oil engine, and we verily believe that those manufacturers who are preparing to change over their gasoline engines to the burning of crude oil and the heavier distillates have their faces set in the right direction so far as the future market in fishing boats is concerned.

It should be borne in mind by the designers of boats and power plants for boats for commercial fishing that, aside from the blunt-pointed stern form for the boat itself, there is no well established standardized practice. The whole industry has arrived at its present proportions with a speed which has left no time for either the boat builder or the fisherman to think through the problems and arrive at very definite conclusions about the best gear, and hence there will be found a tremendous variation in opinion among the practical fishermen as to just what is best.

Pacific Marine Review plans in a series of articles to put before its readers a few suggestions for the solution of the many problems which are facing the fishermen and the fish canning industry of the Pacific, and possibly to show how experience gained in the more slowly developed fishing industries of the Atlantic can be used to good advantage on the Pacific.

THE REVIVAL OF YACHTING

THE year of 1921 has marked a very great quickening in the yachting spirit along the California coast. The strenuous efforts that have been made by the enthusiasts in the various clubs have resulted in quite a program of regattas and races for the summer and fall season.

Last month we recorded the revival of the San Francisco Challenge Cup Race in San Francisco Bay and the Lipton Cup Race in Puget Sound. The Southern California Yachting Association staged a great regatta at Santa Barbara for four days, August 9 to August 12, inclusive, in which many of the most famous of California's pleasure sailing craft and not a few of the motor cruisers took part.

This regatta was preceded by several races among the various classes of yachts and power boats from their home ports to Santa Barbara, and from Newport Harbor in a combined power and sail race the sloop Carollee won from the Joy and the Viking IV from the Uncas. The sloop Gretchen won the race of the San Diego Yacht Club from that port, her one competitor, the Trilby, having to put back with a broken stay. In the race from Los Angeles Harbor all of the contestants, except the yawl Ortona, used their auxiliary power plants, and for that reason the Ortona, although last to arrive, was unofficially declared winner. Captain John Barneson's schooner, the Invader, was the first of the Los Angeles fleet to arrive in Santa Barbara.

Three boats of the San Francisco Yacht Club—the sloop Mah Pe, sailed by Captain Henry Dinning; the ketch Shawnee, L. A. Norris; and the schooner Seaward, Edward Lowe, Jr.—raced from the Golden Gate to Santa Barbara Harbor, a distance of 272 miles. Ordinarily this race should have been practically a run before the Northwest trades, but there is nothing so capricious as wind, and before the race was finished the press of California was full of "scare" headlines about missing yachts. The race started on Saturday morning and was not finished until 6:30 o'clock on Tuesday evening, the little sloop Mah Pe crossing the line at that time three hours ahead of the Seaward and three and a half hours ahead of the ketch Shawnee.

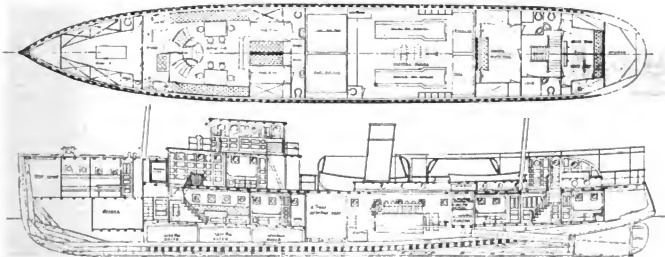
In the race for the Santa Barbara Club cup Captain John Barneson's sloop, the Lady Betty, won out from a very fast field on a 10-mile L-shaped course in one hour, 44 minutes, 29 seconds.

The Lipton trophy race, open only to sloops having a water line of between 20 and 30 feet, was by this provision closed to three or the fastest yachts at the regatta. The Lady Betty's water line is about 18 feet, the Galliano's water line is approximately 34 feet, and that of the Mah Pe, one of the fastest sloops on the coast, is over 37 feet. The Lady Betty, however, was successful in qualifying by loading enough ballast to increase her water line to 20 feet. Thus burdened, she again won against a field composed of the Trilby and the Gretchen of San Diego and the Mischief I from Los Angeles. The Lady Betty, however, was disqualified in this race on account of an alleged foul on the Mischief I in rounding the fourth flag, and the race was awarded to the Mischief I on that ground.

September is to be also a busy month in yachting. The week end from the 3d to the 5th the San Francisco Yacht Club is to hold a great picnic and jollification at McNear's Island and a 30-mile race from the island to Vallejo and return. During the same week end the Vancouver Yacht Club is staging a regatta on Puget Sound.

Many of the boatbuilders are busy on new work, particularly in Southern California. We illustrate below one of the most interesting of the new jobs, a cruising yacht for Captain G. Allan Hancock, the Velerio II, which is now under construction at the William Muller Shipyard in Wilmington. This vessel is 125 feet over all, 20 feet beam and 7 foot draft, designed for a sea speed of 10 knots with a cruising radius of 6000 miles. It is chiefly remarkable for the elegance of its appointments and for the fact that it will be the first vessel built on the Pacific Coast to use the Diesel electric drive.

The power plant will consist of two Winton Diesel oil engines, 6-cylinder, 7½ inch bore and 11 inch stroke, developing 135 B. H. P. at 450 R. P. M., each directly connected to a 90 K. W. 125 volt Westinghouse generator supplying current to a 250 H. P. 275 R. P. M. double armature motor wound to take 125 volts per armature and directly connected through a Kingsbury thrust bearing to the propeller shaft. This power plant makes possible a very easy and direct control of the driving motor from the pilot house. In a future issue we shall give full particulars of this interesting installation.



The cruising yacht Velerio II building at the William Muller Shipyard, Wilmington, to be equipped with Winton-Westinghouse Diesel electric drive

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THE CALIFORNIA

JUST two years ago this month the people of San Francisco Bay region had the joyous privilege of welcoming the great war fleet of the United States Navy assigned for duty on the Pacific Ocean. Now that fleet is welcoming into its midst our own contribution to its numbers, the superdreadnought California.

This latest addition to Uncle Sam's Navy is not only named after "the greatest state in the Union," but was built at Mare Island on San Francisco Bay in the very heart of that state. Into her fashioning California citizens wrought the best of their brawn and brain, and the great majority of the personnel who will man her guns and work her machinery are native born Californians.

The naval vessels built for the United States on the Bay of San Francisco have in times past given very good account of themselves when called upon in emergencies to uphold the honor of the flag, and we are sure that the U. S. S. California, if occasion arises, will uphold the traditions passed down from Santiago and Manila Bay.

PANAMA CANAL

THE report of Governor Morrow to the Secretary of War shows the freight tonnage passing through the Canal in May decreased greatly as compared with April. May, 1921, shows 792,735 tons as against 907,613 tons for April, 1921, and as against a monthly average for the last year of 989,951.

The new trade routes opened by the Canal are doing large volumes of freight business, but it seems to be largely a one-way traffic. For example, the East Coast of the United States shipped 82,537 tons to the

Far East and 31,488 tons to Australia, whereas the Far East shipped only 9883 tons and Australia only 370 tons back to the East Coast of the United States. The Pacific Coast shipped 112,892 tons to Europe and received back through the Canal only 7522 tons.

The following table gives a very interesting comparison of the tonnages carried by the ships of various nationalities and the average tolls paid per ton of cargo:

	Cargo carried	Av. tolls a ton of cargo
British	230,217	\$1.24
Chilean	2,009	2.95
Danish	25,531	.69
Dutch	12,099	.87
French	10,771	1.32
German	711	2.15
Italian	3,614	2.13
Japanese	35,510	1.36
Norwegian	38,017	.77
Peruvian	11,895	.98
Swedish	6,567	1.16
United States	415,794	.80
	792,735	.973

This table, with reservations, may be used as an index to the profits in ship operation. In April the average tolls paid per ton of cargo were .926. In other words, the cargo tonnage more closely approximated the measurement tonnage in April than in May.

Excluding the 183,859 tons of United States coastwise traffic, the cargo in American bottoms would be 231,935 as against 230,217 for British bottoms. As most of the canal business originates and terminates in the United States, these figures are a very uncomfortable indication that British competition is fast overhauling the American merchant marine in carrying American foreign freights.

OCEAN FRUIT TRAFFIC

SHIPMENTS of fruit through the Panama Canal during the past year on an experimental basis have demonstrated that the water route is both practicable and economical, and arrangements are now being made for future shipments on a larger scale.

This trade is being developed along three lines: Pacific Coast fresh fruits to the East Coast of the United States; Pacific Coast fresh fruits to the United Kingdom and Europe; and Chilean fruits to the East Coast of the United States.

It is reported that the California and Northwestern associations of fruit growers organized for the marketing of their crops are in a position to contract with steamship companies for cargo or part cargo lots, and that they have joined in an agreement to guarantee one steamship company 9500 carloads of perishable fruit for Atlantic and Gulf markets to be taken at a rate substantially lower than the present all rail rate. Of this total 4000 carloads are to be Washington apples. The Port Commission of Seattle is stimulating the movement of the fruit through that port by quoting low rates of refrigerator storage in transit.

Citrus fruits shipped from Los Angeles to New York have arrived in nineteen days with very much less percentage of decay and deterioration than in ordinary rail shipments and at a rate less than one-half the all rail rate.

The South American Line, a Chilean company, is reported to be building three large vessels with refrigerator equipment, to be placed in the New York serv-

ice carrying fresh fruits and vegetables. The Chile seasons being the reverse of those on the Pacific Coast of the United States, the Chilean fruit will reach northern markets in the early spring, so that the bulk of the Chilean fruit will be off the eastern markets before the large volume of California shipments begins.

SHIPBUILDING COSTS

EVER since the beginning of the end of the emergency shipbuilding program American shipyards have been making strenuous efforts to reduce costs of construction. That these efforts have not been in vain is shown by not only the actual reduction in figures on private contracts but by the fact that we are getting very measurably close to, if not bettering, the costs of shipbuilding abroad.

Quite recently an American yard bidding on the construction of oil tankers had the contract taken away by a British yard. The American bid was approximately \$175 a deadweight ton, the British approximately \$140. On the face of it this would appear to show that British costs are 20 per cent less than costs in America, but a little figuring on current and normal exchange rates will show that the difference in bid is not actually a difference in cost of construction, but a differential in favor of the British builder through the present abnormal exchange. One hundred and forty dollars is approximately £35, so that we at normal exchange is approximately \$175, so that we may consider this particular contract to prove us on a practical equality in costs with the British shipbuilder.

Much to the dismay of our cousins across the water, there has been recently placed with the New York Shipbuilding Corporation an order from the Japanese government for a combination collier for the Japanese Navy, and American yards have also taken orders from British companies for British tankers. Many of our large repair plants on the Atlantic seaboard are advertising at the present time in British marine journals that they can effect British repairs more quickly and at less cost than is possible in the United Kingdom. Some of these British journals are getting quite alarmed over the prospect of the loss to Great Britain of repair and building contracts, which normally and naturally should have gone to British yards.

In the bulletin of the Atlantic Coast Shipbuilders' Association we find this very optimistic note on the question of shipbuilding costs:

"It is reported that the works manager of one of the largest American shipyards recently stated that cargo carriers of the standard type could be built in this country at \$115 per ton, \$100 less than the Shipping Board steel fleet cost per ton. It is understood that this price would also allow the shipbuilding company to make a profit. It was stated that the increased efficiency of labor is responsible for the ability of the yards to build at a lower cost, although material and freight rates remain considerably above the pre-war figure. The president of an American shipyard has been quoted as saying that American shipyards could now build passenger liners as cheaply as the British or French shipbuilding plants. The American repair yards advertise in British papers that repairs may be effected in this country more cheaply than in the United Kingdom yards."

SHIP PRICES

NOTWITHSTANDING the strenuous efforts made to lower the cost of construction on ships, it cannot be denied that current sale prices of new and used vessels are still extremely small in

comparison with construction cost figures. Great Britain is still the world's market for ships, and the attached list printed by the Newcastle Daily Chronicle recording the sale of fifty-eight British cargo carriers of an aggregate deadweight tonnage of 282,672 can be taken as a very fair average of the present price that may be expected for ships sold.

These ships, sold during the first quarter of 1921, brought an average price of \$14, or, at present exchange rates, approximately \$54. Most of these vessels were quite new, and the figures obtained on these sales should be extremely interesting to American ship operators in general and to the Shipping Board in particular as indicating in a general way not only the price that may be expected on the sale of any considerable tonnage of Shipping Board vessels, but also as indicating to the operator the proper book value of the vessels that he is operating.

The Newcastle Daily Chronicle's figures follow:

List of Trading Steamers Sold			
Sold	D. W. Tons	Total Tonnage	Amt., £
2	Under 1,000	450	7,750
7	1,000-2,000	10,520	145,600
6	2,000-3,000	13,707	134,000
4	3,000-4,000	13,750	125,000
10	4,000-5,000	43,117	374,000
2	5,000-6,000	11,790	70,500
11	6,000-7,000	50,740	526,500
6	7,000-8,000	45,507	415,500
6	8,000-9,000	50,291	1,349,000
2	9,000-10,000	19,100	275,000
2	Over 10,000	23,700	350,000
58		282,672	4,073,850

These figures give an average of only £14 8s. 2d. a ton deadweight, compared with former figures ranging up to £40, £50 and £80 a ton.

DO YOU KNOW

That California is now the first state in the Union in the volume and value of her fisheries' products?

That the sardines alone canned in California last year would, if placed end to end, make a double girdle around the earth at the equator and have enough left over to make a border around the United States?

That the Fish Commission of California is the oldest body of its kind in the United States, antedating by one year the Bureau of Fisheries of the Federal government?

That on September 9, 1850, there were in the harbor of San Francisco more seagoing ships than in any other harbor of the United States?

That Germany has under construction a large program of motorships?

That the captain of a vessel is personally responsible for the wages of his crew?

That American registry is sometimes not American registry?

Information on all of these points and many other interesting phases of American marine life is covered in this issue of Pacific Marine Review.

OUR COVER

Shows the West Faralon, second of five 11,000-ton flush deck freighters built for the U. S. Shipping Board by the Los Angeles Shipbuilding and Dry Dock Company, on her trial run in Los Angeles Harbor.

These freighters combine exceptional cargo carrying capacity and ample cargo handling facilities with a loaded sea speed of 11½ knots at very low fuel consumption.

ARGOES OF THE ARGONAUTS (Continued)

NAME	Flag	Rig	Tonnage	Date of Arrival
Sarah Sands	Br.	Stmr.	188	Sept. 7, '50
Sarah Warren	Am.	Bk.	359	Apr. 6, '50
Sarah & Eliza	Am.	Sh.	359	Aug. —, '50
Saratoga	Am.	Sh.	1200	July 30, '50
S. D. Bailey	Am.	Sc.	98	June 25, '50
Sea Eagle	Am.	Bg.	199	Oct. 30, '49
Sea Gull	Br.	Bg.	61	Aug. 11, '50
Sea Gull	Nor.	Bk.	203	Aug. 12, '50
Sea Gull	Am.	Stmr.	266	Aug. 10, '50
Sea Witch	Am.	Sh.	907	July 24, '50
Seise de Junio	Ch.	Bg.	117	Sept. 5, '50
Selina	Am.	Bg.	407	Sept. 8, '50
Selma	Am.	Bk.	407	Oct. 6, '49
S. H. Waterman	Am.	Bk.	480	June 16, '50
Sheridan	Am.	Sh.	900	July 31, '50
Sierra Nevada	Am.	Sc.	90	May 21, '50
Sir Geo. Pollock	Br.	Sh.	630	July 31, '50
Siroc	Am.	Bg.	168	June 15, '50
Six Brothers	Am.	Bg.	147	May 6, '50
Smyrna	Am.	Bk.	370	Aug. 21, '50
Solomon Piper	Am.	Bk.	196	Aug. 15, '50
South America	Am.	Sh.	605	Jan. —, '50
Sovereign	Am.	Sc.	90	June 19, '50
Spartacus	Am.	Sc.	92	Aug. 12, '50
Spartan	Br.	Bk.	366	Sept. 2, '50
Spencer	Br.	Bg.	188	Aug. 6, '50
Splendid	Am.	Sh.	392	Feb. 15, '50
Splendid	Am.	Bk.	—	Sept. 4, '50
Star	Am.	Bg.	212	June 5, '50
Star of China	Br.	Bg.	101	Oct. 11, '49
State of Maine	Am.	Sh.	727	Aug. 8, '50
Steiglitz	Am.	Sh.	349	June 22, '50
Success	Am.	Bk.	203	Apr. 7, '50
Suliot	Am.	Bk.	260	Aug. —, '50
Superior	Am.	Sh.	575	—, '49
Surprise	Fr.	Sc.	22	June 25, '49
Surprise	Fr.	Sh.	273	June 15, '50
Susan	Am.	Bk.	281	Aug. —, '50
Susan Abigail	Am.	Bg.	210	May 29, '50
Susan Drew	Am.	Sh.	696	Feb. 26, '50
Susan G. Owens	Am.	Sh.	730	July 24, '50
Susan Wardwell	Am.	Sc.	120	Aug. —, '50
Swiftsure	Am.	Bg.	215	July 30, '50
Swiss Boy	Am.	Bg.	260	Aug. 6, '50
Tahmaroo	Am.	Sh.	375	July 1, '49
Talca	Chile.	Bg.	188	Aug. 4, '49
Talma	Am.	Bg.	391	Mch. —, '50
Tarquin	Am.	Bk.	420	Aug. 5, '50
Tasso	Am.	Bk.	286	Oct. 12, '49
Teal	Br.	Bk.	364	May 2, '50
Tecumseh	Am.	Bk.	391	Jan. 7, '50
Tecumseh	Am.	Bg.	190	Apr. 30, '50
Telassar	Am.	Sh.	—	Sept. 5, '50
Thames	Am.	Sh.	414	May 27, '49
Thili	Chile.	Sc.	92	Jan. 22, '49
Thomas Bennett	Am.	Sh.	483	Nov. 8, '49
Thomas Lord	Br.	Sc.	70	Dec. 28, '49
Thomas P. Hart	Am.	Bg.	173	Aug. —, '50
NAME	Flag	Rig	Tonnage	Date of Arrival
Thomas, W. Sears	Am.	Sh.	500	July 15, '50
Tiberias	Am.	Bk.	300	July 24, '50
Timbo	Br.	Sc.	123	July 1, '50
Toccoa	Am.	Sc.	28	Apr. 12, '50
Toulon	Am.	Bk.	272	May 16, '50
Traveller	Am.	Sc.	—	May 13, '50
Treaty	Am.	Bg.	240	Oct. 3, '49
Tremont	Am.	Bg.	278	May 5, '50
Trenton	Am.	Sh.	668	Aug. —, '50
Triton	Br.	Bg.	—	July 8, '50
Triumph	Am.	Bg.	187	June 6, '50
Two Brothers	Am.	Sc.	67	Aug. 15, '50
Tyrone	Am.	Sh.	537	Nov. —, '49
Undine	Am.	Bk.	215	May 13, '50
Unicorn	Br.	Stmr.	650	Oct. 31, '49
Union	Br.	Sc.	73	Aug. 17, '50
Urania	Am.	Sc.	197	July 22, '50
Utica	Am.	Sh.	525	Jan. 27, '50
Valhalla	Am.	Bk.	275	May 18, '50
Valparaiso	Am.	Bg.	697	June 28, '50
Vandalia	Am.	Sh.	360	July 6, '50
Veloz	Chile.	Bg.	104	Jan. 15, '50
Venice	Am.	Sh.	420	Aug. 13, '50
Vesta	Am.	Bg.	155	Dec. 1, '49
Veto	Am.	Bg.	149	Aug. 13, '50
Victoria	Am.	Bk.	38	Aug. 22, '50
Victoria	Mex.	Sh.	345	Mch. —, '50
Victorine	Am.	Bg.	115	July 30, '50
Virginia	Chile.	Sh.	230	Aug. 13, '50
Vistula	Am.	Sh.	365	Jan. 9, '50
Volante	Br.	Bg.	154	May 6, '50
Volante	Peru.	Sc.	90	Mch. —, '50
Wakullah	Am.	Bg.	207	Aug. 4, '50
Waldemar	Dan.	Bk.	300	Aug. 3, '50
Wallace	Am.	Bk.	300	Aug. 29, '50
Walter	Am.	Bk.	256	Nov. —, '49
Wataga	Am.	Sh.	415	June 17, '50
Water Lily	Br.	Bg.	155	Aug. 16, '50
Wave	Am.	Sc.	21	Jan. —, '50
Wellingsley	Am.	Bg.	210	May 6, '50
Will	Am.	Bg.	147	Aug. 15, '50
Will o' the Wisp	Br.	Bg.	101	Aug. 2, '50
Will Watch	Br.	Bg.	50	July 1, '50
William A. Spofford	Am.	Sc.	197	Aug. 12, '50
William Brandt	Russ.	Sc.	900	July 28, '50
William G. Hackstaff	Am.	Sc.	92	June 29, '49
William Gray	Am.	Bk.	295	June 15, '50
William Joy	Am.	Bk.	194	July 7, '49
William O. Alden	Am.	Bk.	274	May 6, '50
William Penn	Am.	Bg.	158	Feb. 21, '50
William and Henry	Am.	Sh.	260	Sept. 16, '49
William and James	Br.	Sc.	74	June 17, '50
Windsor Fay	Am.	Bk.	—	July 28, '50
Winslow	Am.	Bk.	263	June 25, '50
Winthrop	Am.	Bg.	230	July 30, '50
Woodside	Am.	Sc.	55	June 16, '50
Zenobia	Am.	Sh.	630	Aug. 13, '50
Zingari	Am.	Bk.	386	Aug. 4, '50
Z Ring	Am.	Bk.	223	July 31, '50
Zuid Pool	Holl.	Sh.	320	Sept. —, '49



WHAT IS WRONG WITH THE AMERICAN MERCHANT MARINE?

WE have a large number of ships on the ocean. They are to be seen in plenty at practically every port. In all of the British channel ports—and we have visited most of them—could be seen ships flying the American flag. The same was true for Hamburg, for Rotterdam, and for the ports of the Baltic. As I am writing, I can see, from the porthole of my stateroom, four or five ships with the American flag. We have the ships but we do not seem to be getting the business, and I read in the papers from home of many ships laid up both on the many ships laid up on the Atlantic Coast, in the Gulf ports and on the Pacific.

What is wrong with the American merchant marine?

The answer is easy.

From the standpoint of an engineer or deck officer, the difficulty lies largely in the fact that the ship's officers have no way in which to enforce their orders, and there is practically no discipline. On an American ship under Shipping Board regime as at present in force, a fireman, wiper, water-tender, oiler, seaman, or any other subordinate can practically do as he pleases on account of the fact that they know that the slightest enforcement of discipline by the officers can be reported on shore to the disadvantage and possible discharge and disgrace of the officer.

In port the crew do practically as they please—go ashore and return when they get good and ready. If any disciplinary measures are attempted, the crew immediately go to the American consul and tell him any kind of story that comes into their heads. The consul then sends for the captain and chief engineer, has them up on the carpet for a "call-down," usually giving to the crew anything that they want, delays the ship, has the ship's officers running back and forth—ship to shore—all at the expense of the ship operator and the American people through the Shipping Board.

The clause in the LaFollette Act, confirmed by the Jones Act, which allows the crew to draw pay at any port, gives large opportunity for men to go ashore at European ports, get drunk, run with women, find all kinds of deviltry ashore, and then come back to the ship in a condition fit for the hospital, and draw their wages on the return trip while laid up on account of their own villainess.

To me, the only cure for this aspect of American merchant marine operation lies in changing the laws so as to give officers on board any American ship the power to see that their orders are carried out and to free those officers from the petty annoyances which are constantly being imposed upon them through the organizations of marine labor. Then make sure that the men who man the ships are thoroughly American, both as to citizenship and as to ideals—that they are

A first assistant engineer on a California-built steamer, owned by the United States Shipping Board and at the time discharging cargo in a European port, asked himself the question which forms the title for this article. The article is his own answer to the question and evidently is given without any particular attempt at scientific analysis. It comes straight from the heart of the man as an expression of his experience. It was sent to us in the form of a letter.

You, dear reader, may not agree with all the conclusions reached by our correspondent, but there can be no doubt that he is accurately describing the actual conditions at present existing on American and particularly Shipping Board vessels.

These conditions must be radically changed if America is to attain the position she should hold in merchant marine service.

clean men of sound mind and body, and that they know their trade as seamen. Then there should be a thorough understanding as to working hours and conditions of living. I believe that when a man signs on as a ship's officer there should be an understanding for at least one year with a firm or for a certain ship, and that the remuneration should be based on a certain minimum wage and on the showing made for economy of operation by the ship. In the case of an engineer this man should have served his time in a first-class marine engineering shop and have been to sea at least one year as a junior engineer. If during this year the man has shown himself to be idle or dissipated, the company will know of it and he should never receive his ticket as a third assistant.

No man can serve two or more masters at the same time, and it is beginning to be ap-

parent that a man cannot serve his employer properly and be a member of a labor union at the same time. Very frequently at sea directions by the chief engineer or the captain are held up by insubordinates with the remark that the union rules are so and so. No man with union rules upmost in his brain can possibly be an efficient worker, either on the deck or in the engine room of an American merchant ship.

The whole economy of operation must be based on prompt and cheerful obedience to the orders of superiors who have learned by training and experience what is the best thing to be done under any given emergency, and the kind of men who are needed in our merchant marine today are those who will promptly and cheerfully obey orders and learn from the results of that cheerful and prompt obedience how to act themselves when circumstances place them in authority. The same Great Teacher who first told us that no man could serve two masters told us also in beautiful parable that he who was faithful in little things should be made ruler over great things.

I am a married man with a family to take care of, and I am going to do it, and I believe every man should do the same. I may be called a "scab" or something worse, but I have the satisfaction of knowing that in what I do I am honoring my flag, my country and my home, and I sincerely hope that my brother engineers will see these matters in the same light and put their shoulders to the wheel in trying to keep that flag in an honorable place among the merchant navies of the seven seas.

ERRATA

On page 473 of the August issue of Pacific Marine Review the caption under the cut of the motorship Yngaren located the Yngaren and Sunderland and the shipbuilding yards of William Doxford and Sons, Limited, on the Tyne, whereas all three are "really" located on river Wear some 20 miles south of Tynemouth.



Oil Engines and Motorships



PROGRESS IN MOTORSHIP BUILDING

THE very healthful condition of the infant motor shipbuilding industry is indicated by Lloyd's quarterly shipbuilding returns issued June 30. These returns show that there are 183 motorships with a gross tonnage of 502,944 under construction at the present time in the world's shipyards. These figures do not take into account the motorship construction in Germany, and, as was intimated in these columns last month, Germany is putting on quite a sizable motorship program. If the German figures were added, the total number of sea-going motorships would be over 210 with a gross tonnage well over 600,000.

The interesting fact which stands out in these figures is that, while the number of steamers under construction has fallen approximately 14 per cent as compared with the preceding quarter, the number of motorships building is practically the same. Of this motorship program over 200 are in European shipyards, while only three, with a gross tonnage of 18,850, are building in the United States.

These figures show very plainly that our European rivals are fast gaining the advantage in economically operated cargo ships. In Sweden there is a tonnage of motorships building twice as large as the tonnage of steamers and, according to the present trend, no more steamers will be ordered for offshore trading. It is also worthy of note that at the present time no steel sea-going motorship is laid up for lack of freight, while many hundreds of steel steamers are so laid up.

Scandinavian Motorships

The Johnson Line of Stockholm, well known on the Pacific Coast, has just announced that, subject to the permission of the Swedish government, it proposes to sell all of its steamers and to build and operate motorships exclusively. This progressive firm recently launched their twelfth motorship, the Cometa, at Burmeister & Wain's yard. At the present time the total steam fleet

of this company, aggregating 50,000 tons, is laid up, not being able to make a profit in carrying freight, while its motor vessels, aggregating 80,000 tons deadweight, are all in daily service. The Johnson Line has two other motorships building at Burmeister & Wain's, and as soon as its steamers are disposed of it will undoubtedly order many more.

Practically every Scandinavian shipowner appears to be tending in the same direction. The East Asiatic Company has already sold all its steamers and now possesses fifteen fine sea-going motorships. The Transatlantic Steamship Company of Gothenburg is building three oil-engined ships and, according to the statement of its directors, does not intend to build any more steamers. Two-thirds of the ships under con-

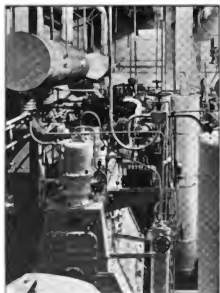
struction in Scandinavia at the present time are motor vessels.

New British Orders

Messrs. Hunting & Sons have contracted with the Tyne Iron Shipbuilding Company for a 10,000-ton motorship, their first oil-engined craft. This ordinary cargo boat will be 365 feet in length, 51 feet beam, and 25 feet draft. The machinery equipment will consist of two Werkspoor motors, each of 1200 i. h. p. generated in six cylinders with 560 m.m. bore and 1000 m.m. stroke, running at 120 r. p. m. These motors will be built by the Northeastern Marine Engineering Company of Wallsend-on-Tyne, who had in the past the largest output of marine steam engines of any British firm. They have converted their shops for



Working platform, U. S. S. B. motorship William Penn



Engine room of motorship William Penn, port side, showing B. & W. generating sets

the manufacture of marine Diesel engines on a large scale and hold the Werkspoor license.

Motor Shipbuilding on the Tyne

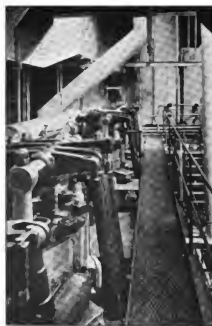
Practically every large Tyne shipbuilding firm is now actively engaged in motorship construction, and even the most conservative of builders recognize the fact that shipowners will not order steamers on any

large scale as long as they have to compete with motorships. In fact, it may be said that the greater the shipping slump the more favorable will be the reaction upon the development of motor craft, and as soon as trade shows a tendency to revive, British shipbuilders will be ready for the flock of motorship orders which is expected to be forthcoming.

Single Screw Motorships

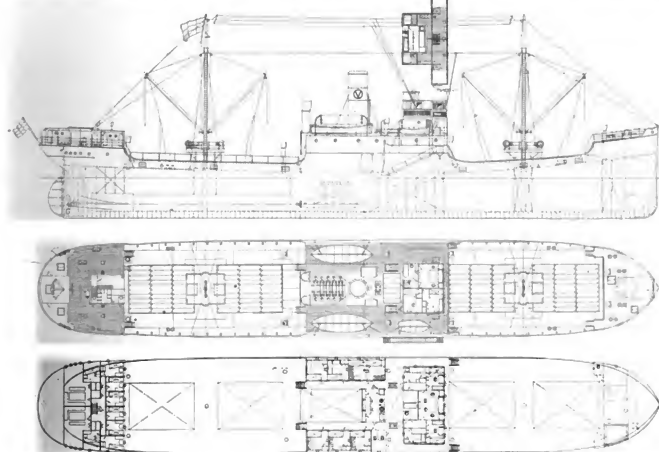
As noted in our columns last month, the Doxford-engined Yngaren has been completed, and two similar single screw vessels are on the stocks. Beardmore's are also constructing three ships, each equipped with only one engine. Several single screw motorships have been built and are under construction in Holland, and the Swedish shipyard, Ore-sundavarvet, has just completed the Sulina, a single screw cargo carrier for the Swedish Levant Company. She is engine with a 1600 horsepower Burmeister & Wain type built by Gotaverken. This ship will carry 4450 tons deadweight, and it is understood that she will be used as an ordinary tramp.

Shipowners are very seriously considering the oil engine for the tramp class of ship, owing to the fact that



Upper platform of motorship William Penn, showing tops of cylinders

there has been during the past year or two a large increase in oil bunkering stations throughout the world and oil of suitable quality for Diesel engine work can be obtained in practically all of the principal ports. The great majority of European engine



Profile and plans of 2790-ton D. W. C. motorship building at the Burgerhout Ship Yard, Rotterdam. She is powered with twin 600 H. P. Bolinder engines of new design

manufacturers are developing special types of slow speed long stroke motors for installation in single screw craft, these engines being arranged to drive their own auxiliary machinery and form a self-contained unit which can be substituted for the steam engine in conversion jobs.

German Program

One firm alone in Germany, the Deutsche Werft of Hamburg, has orders for ten cargo ships totaling over 60,000 tons deadweight, all to be engined with Burmeister & Wain type Diesels manufactured at the A. E. G. Works in Berlin, the only change from the standard B. & W. design being a slight alteration in the method of operating the maneuvering gear. The engines are of 1550 i. h. p., two being installed in each ship. The standard Danish arrangement for engine room auxiliaries has been adopted with the usual electrically operated air compressor. It is estimated that over 200,000 tons of motorshipping is now on order in Germany, and the development there should be watched very closely.

High Powered Semi-Diesel

A very interesting development has recently come to light in the new design for the Bolinder engine. An efficient electric plug has been developed for starting in place of the bulb and torch, so that now the engines can be started from cold very much more quickly and efficiently. The power per cylinder has also been increased and the air compressor dispensed with. The new motors are directly reversible and are claimed by the manufacturers to have all the advantages of the Diesel engine and at the same time to be more cheaply constructed and more simple to operate.

Two of these engines of 600 b. h. p. each are now being installed in a 2700-ton deadweight capacity ship building at the Burgerhout shipyard at Rotterdam. This vessel is 250 feet in length with a beam of 40 feet 8 inches and is expected to prove a very useful and economical type. The auxiliary plant on this ship is driven entirely by electric motors, the power being supplied by three Bolinder motor generating sets of 40 horsepower each.

American Motorship Program

To offset this splendid European program of motorships, the United States has at the present time under construction one motor tanker, the H. T. Harper, building at the Moore Shipbuilding Company, Oakland, California, and to be delivered probably during September, and two freighters building at the Merchant Ship-



A snap of the American motorship Kennecott at a San Francisco pier by our staff photographer

building Corporation, Chester, Pennsylvania.

The tanker H. T. Harper will be 330 feet in length, 46 feet in beam, 21 feet 6 inches loaded draft, and of 4750 deadweight tons carrying capacity. She will be engined with two Werkspoor engines built by the Pacific Diesel Engine Company of Oakland, each of 1100 i. h. p.

The freighters building at the Merchant Shipbuilding Corporation, Chester, Pennsylvania, have not yet been named. They are on order for the American-Hawaiian Steamship Company and are to be 445 feet long, 59 feet 8 inches beam, 28 feet 6 inches loaded draft, 11,000 deadweight tons carrying capacity, 11½ knots speed. They will each be engined with two six-cylinder Burmeister & Wain type Diesel engines, each of 2250 i. h. p. supplied by the William Cramp & Sons Ship & Engine Building Company.

U. S. Shipping Board

It certainly is high time that American shipowners, shipbuilders and marine engineers should awaken to the importance of motorship development, and it is to be hoped that the William Penn, recently delivered to the Shipping Board—and evidently from her description a first-class Burmeister & Wain type motorship—will be given a most thorough and painstaking trial and that the results will be given the widest publicity, for it seems as if no records in marine engineering or marine operation have any very great effect upon the American engineering mind unless they are made under American auspices.

It is rather unfortunate in this connection that the Shipping Board should in its trials of this vessel be in the position of being the owner of the largest number of steamships under single ownership in the world,

so that if it should be proven by the trials of this single ship that the motorship is vastly superior to the steam-engined vessel, the Shipping Board will by publishing that superiority immediately reduce the value of its great fleet of steamers. Bearing this fact in mind, shipowners should watch the operation of the William Penn very carefully themselves and draw their own conclusions as to the economy of the Diesel engine at sea.

The Trend in Diesel Engines

Some of the engineering societies in Great Britain have recently drawn attention to the fact that the present trend in design of Diesel engines toward large cylinder diameters is in a very risky and dangerous direction. The larger the cylinder the greater the metallurgical problem, and the metallurgical problem has always been the great stumbling block in the production of Diesel engines of high power.

Some recent developments brought out by Michell, the designer of the Michell thrust block, have turned the attention of engine designers to the old swash-plate substituted for the crank in reciprocating engines with promise of good results. In another part of this issue the design of the Michell engine is described somewhat in detail. It is sufficient to say here that this design produces a very compact arrangement of small cylinders located concentrically with the shaft and working in opposed couples against the swash-plates in such a way as to balance all internal strains.

The British Diesel engine designers are now engaged on the adaptation of this idea to the Diesel engine principle, and there is some hope expressed that this form of engine may work out with a very economical and compact oil-burning unit.

SPANISH DIESEL ENGINED

Coaster Fitted with Kitchen Reversing Rudders

SINCE the days of Columbus history has seldom attributed to Spain the lead in any direction of national enterprise, including even navigation, in which the Spanish were at one time Britain's keen rivals. It is noteworthy, therefore, that one of the newest inventions affecting the progress of navigation—namely, the Kitchen reversing rudder—has been adopted by Spanish owners in one of their coasting vessels, the *Alca*, which at the present moment is one of the largest vessels fitted with reversing rudders actually at work.

Some particulars of the vessel will no doubt prove interesting to our readers, particularly those concerned with the motor-driven vessels. The *Alca* is a steel vessel of 500 tons displacement and 300 tons deadweight carrying capacity engaged in carrying coal and general cargo along the Atlantic Coast of Spain. Her dimensions are: length 140 feet, beam 22 feet 3 inches, and depth 10 feet molded, her load draft being 8 feet 3 inches. Originally built as a sailing vessel, she has now been re-rigged and equipped with a 150 b. h. p. Sulzer Diesel land type engine, which turns a propeller of 4 feet diameter. The engine has no reversing or clutch devices of any kind, and all stopping, running astern and maneuvering of the vessel is obtained solely with the Kitchen reversing rudder.

To install these rudders the original rudder post was removed by cutting it through at the top and bot-



Stern view of Spanish coasting vessel *Alca*, fitted with Kitchen rudder

tom of the propeller aperture; an extension to the stern foot to take the bottom pintle was added and securely riveted to the keel; and at the top of the rudder a strong gudgeon or bearing was riveted to the ship frame.

The rudder blades are of mild steel plate $\frac{1}{2}$ inch thick; the inside dimensions of the blades are 64 by 58 inches, the major axis being horizontal.

The speed and reverse control wheel for operating the rudder is

mounted in the wheelhouse on the starboard side of the steering wheel. The motion from this control wheel is conveyed to the rudder head operating gear by means of steel chains over guide sheaves and rollers, and it is this wheel which regulates the opening and closing of the rudder blades and of course all their intermediate positions.

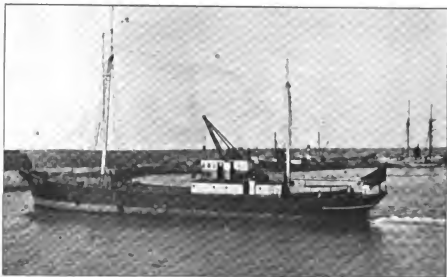
Helm is controlled in exactly the same manner as with the ordinary type of rudder, and for those who are not conversant with the Kitchen reversing rudder it may be pointed out that the opening and closing of the rudder blades in no way interferes with their helm carrying powers. Either of these operations can be carried out independently of the other, as they are not interconnected.

The vessel attains a sea speed under power of $6\frac{1}{4}$ knots, and the following results of maneuvering trials are interesting. The astern speed was $2\frac{1}{4}$ knots. The time taken to bring the vessel from full speed ahead to dead stop was 34 seconds and the distance traveled was 200 feet. The diameter of her turning circle at full speed ahead was 140 feet, less than the vessel's own length. The time taken to spin about an axis amidships, as if on a pivot, through a half circle, occupied 1 minute and 25 seconds.

The rudder control is most efficient and practically instantaneous in effect and permits the maneuvering and working of the vessel in and about the congested harbors and docks with the greatest ease and reliability.



Inside wheel house of *Alca*, showing double control of Kitchen rudder



The Spanish motor coaster *Alca* returning from her trial trip



Material Handling



CONVEYING AND ELEVATING MACHINERY

In the Sugar Warehouse at Crockett

By HENRY T. HESSELMAYER

Chief Engineer, Meese & Gottfried Company, San Francisco, California

THE main building at Crockett was erected in 1880 and used for many years as a flour mill.

About 1900 it was changed to a beet sugar refinery and in 1903 was turned over for the purpose of refining cane sugar only and has been used for that purpose ever since. As early as 1905 conveyors were installed for handling the sugar and these conveyors are still in use, having been added to from time to time as the capacity of the refinery was increased.

Early in 1917 the directors decided to increase the capacity of the refinery to 2000 tons a day. This made necessary a thorough overhauling and partial rebuilding of both the refinery and the warehouse and during this reconstruction the present system of conveyors and elevators was worked out by Mr. George M. Rolph, general manager of the California & Hawaiian Sugar Refining Corporation, and his engineering staff at Crockett, assisted by the engineers of Meese & Gottfried. Much time was spent in the arrangement of these conveyors and in consideration of the co-ordination of the system so that the vast amount of material could be handled to the greatest advantage.

On the site of the old wooden structure a new modern warehouse is being built with concrete floor, supported on concrete and wood piling, brick walls and reinforced concrete roof. This building will be 200 feet wide, 1000 feet long and about 40 feet high in the clear, in four sections, each 250 feet long, separated by brick fire walls. Sections numbers 1 and 4 of this new building have been finished and as fast as is practicable the wooden section between them will be changed over.

The floor of this warehouse is

In the August issue of Pacific Marine Review we described somewhat in detail the refinery of the California and Hawaiian Sugar Refining Corporation, which is located at Crockett, California, about thirty miles northeast of San Francisco. In that article reference was made to the very extensive system of conveyors used in the warehouse and refinery, all of which were installed by Meese & Gottfried of San Francisco. We are therefore very glad to be able to give to our readers the present article, which details quite elaborately the conveying system as installed in the warehouse at Crockett, which is probably the most extensive of its kind on the Pacific Coast, and we are especially glad to have this description prepared by Mr. Henry T. Hesselmeier, who, as chief engineer of Meese & Gottfried Company, was principally responsible for this installation.

continued out over deep water to form a dock for unloading the ocean going vessels which deliver the raw sugar from Hawaii. The warehouse is arranged with unloading platforms on a second level above the dock so that the sling loads of sacks of raw sugar may be delivered by the ships' winches either on the platforms or on the dock level. With this arrangement it has been found possible to work the ships' winches up to their capacity.

Dock Conveyor

Just outside the north wall of the warehouse is located what is known as the dock conveyor. This is a horizontal belt, 36 inch wide 7-ply rubber, with the centers of the driving pulleys 1000 feet apart. This

belt is driven from both ends and is designed to deliver sugar on both the upper and lower stretch, carrying sugar in both directions at the same time. This arrangement required special designing for suitable takeups for slack at both ends of the belt. The driving machinery at each end consists of two cast iron pulleys of 58 inches diameter by 38 inches crown face, rubber lagged. These pulleys are fitted to 5 7/16 inches diameter shafts, the outer ends of which each carry a spur gear of 61 inch pitch diameter. The bearings of the pulley shafts are so placed that these spur gears mesh on their pitch lines. These gears are driven by a cast steel spur pinion, power being transmitted from a 25 h. p. motor through a Meeseco short center belt drive using 10-inch double leather belting to a large pulley on a countershaft, thence through double reduction spur gears to the main spur pinion. It will be seen that each of the driving pulleys of the belt conveyor has a large arc of belt contact. A gravity takeup, consisting of a floating idler pulley 48 inches diameter by 38 inches face, mounted on a shaft whose bearings are carried in a cast iron frame which has free vertical action on pipe guides sufficient to handle 20 feet of belt, is loaded with sufficient weight to give the proper tension at all times.

This driving mechanism is duplicated at the other end of the belt, with the exception that here a swinging belt tightener is provided which acts as an auxiliary takeup to the gravity mechanism at the other end. Both upper and lower belts run on pipe rollers 5 inches in diameter by 39 inches long, 7/8 inch diameter end shafts of these rollers being carried in hard maple blocks which serve as bearings.

This belt is designed to handle

1500 tons of sugar per day in each direction at a speed of 100 feet per minute. Sugar can be taken off this conveyor at any point on the first floor.

Inclined Slat Conveyor

To avoid unnecessary handling as much of the sugar as possible is taken directly from the ship to the melt house in the refinery. For this purpose an inclined slat conveyor was installed near the east end of the dock conveyor and parallel with it. This conveyor is 36 inches wide by 100 feet long between centers of head and tail sprocket shafts, and has an inclination of 20 degrees from the horizontal. It delivers bags of sugar to either the north or south main conveyors leading into the refinery. It is composed of number 212 interlocking bolted roller chain of 4-inch pitch, with A-2 right and left attachments to every link, and 1 $\frac{3}{8}$ inches thick by 3 $\frac{1}{2}$ inches wide pine slats 36 inches long bolted thereto. The speed is 110 feet per minute, the drive being a 15-horsepower electric motor transmitting power through a Meeseco short center belt drive to double reduction spur gears at the head sprocket shaft.

Main Belt Conveyors

The main North and South belt conveyors to which sugar is delivered by this inclined slat conveyor are located on the second floor of the warehouse and the third floor of the refinery and are each, like the dock conveyor, designed to carry sugar in two directions. They are 36-inch wide 7-ply rubber belting and are each about 800 feet long between centers of the driving pulleys. They are parallel with each other, having a passageway of four feet between them. Each is capable of handling about 2000 tons of raw sugar per day if necessary, the duplication being provided to insure against all possible contingency of shut-down, and both belts are in daily operation at about half their capacity. They are driven by the same mechanism as has already been described for the dock conveyor. They receive raw sugar at the west end and carry it on the upper belts to the cut-in station on the third floor of the refinery above the raw sugar bin. The speed of these belts is 130 feet per minute, slightly faster than that of the dock conveyor. After discharging the raw sugar on the third floor of the refinery the belts pass over 48-inch idler pulleys and descend to the second floor of the warehouse, where the driving machinery is located. Here after leaving the gravity takeup the belt runs

under the second floor and refined sugar is loaded on the return belt for conveyance to warehouse number 5, or, if intended for shipment by steamer, for conveyance to the 36-inch compartment conveyor which takes it to the end of the raw sugar warehouse.

High Cross Conveyors

Raw sugar coming from the dock conveyor to be stored in the first section of the new warehouse is sent over one or both of the high cross conveyors. These are located nearly in the center of the warehouse section and run at right angles to the dock conveyor. They are spaced 16 feet apart. These conveyors carry sugar only on the upper belt but are used for the conveyance of both raw and refined, arrangements being made for reversing the direction of travel of the belt at will. The receiving ends near the dock conveyor are about 10 feet above the floor of the warehouse so that bags of sugar can be sent down on chutes from either the upper or lower belts. For a distance of 120 feet the high cross conveyors rise at an angle of 14 $\frac{1}{2}$ degrees and reach a height of 40 feet above the floor. They then pass over the high storage conveyors and descend at an angle of 14 $\frac{1}{2}$ degrees for a distance of 65 feet, entering the refined sugar warehouse through openings in the wall. Each of these high cross conveyors has a total length of 200 feet between centers of pulleys.

In handling raw sugar the bags are taken off these conveyors by means of deflecting plates and deposited on the high storage conveyor by which they are distributed to any portion of the warehouse and deposited through portable chutes. The refined sugar coming from either the main north or south belt conveyors passes by the deflecting plates and continues until it reaches the main 36-inch belt conveyor in warehouse number 5, from which it is distributed to any point in the refined warehouse.

The high cross conveyors are composed of 7-ply rubber belting, 36 inches wide. They are driven at the upper end only and travel at 150 feet per minute. Power is provided by a 15-horsepower motor driving through the Meeseco short center belt drive and double reduction spur gears. Suitable gravity takeups are provided and the belts are carried on pipe rollers at intervals of 3 feet, with idler pulleys 36 inches diameter at points where the direction is changed. These conveyors are mounted on structural steel trusses extending across the full

length of the warehouse, the trusses being supported by I-beams placed between the columns. A walkway is provided on the side of each truss for inspection of the conveyor.

Another high cross conveyor is provided, similar to those just described, for taking sugar from the east end of warehouse number 1 into warehouse number 4. This belt conveyor is inclined at 14 $\frac{1}{2}$ degrees for 120 feet, at which point it reaches a height of 40 feet above the floor. It then runs horizontally for about 400 feet to the south end of warehouse number 4. From this conveyor bags of sugar can be discharged to any position in warehouse number 4 by means of suitable wooden chutes.

For returning raw sugar from warehouse number 4 the roller chain slat conveyor is provided which lifts the sugar from the floor of the warehouse and delivers it onto the high cross conveyor, whose direction of travel is reversed to take the raw sugar back for delivery to the other conveyors which carry it to the cut-in station.

High Storage Conveyor

At the center of the warehouse and extending its full length is located the storage conveyor. This is practically a duplicate of the dock conveyor. It is 1000 feet long between centers of pulleys, driven at both ends, travels 180 feet per minute, carries sugar diverted to it from the high cross conveyors and carries sugar both on the lower and upper belts. It will be noted in this description that each of these belt conveyors travels faster than the one preceding it, this arrangement doing away with any danger of blockage. The steel channels which support the bearings of the pipe rollers for the belts of this conveyor are hung from the lower cords of the roof truss, and the driving machinery is supported on a platform made up of heavy I-beams and also hung from the trusses of the roof. By the use of the conveyors so far described the warehouse can be entirely filled with sacks of sugar piled 35 feet high.

Floor Conveyors

For withdrawing sugar from the warehouse use is made of floor conveyors. In the center of the warehouse and level with the floor a series of three slat conveyors was installed over fifteen years ago and these are still in use. They are composed of two strands of interlocking bolted roller chain 4-inch pitch, with bolted pine slats 3 $\frac{1}{2}$ inches wide and 24 inches long. Each sec-

(Continued on page 537)



View from inshore end of Portland municipal terminal number 4, showing grain elevator and administration buildings

PORTLAND'S NEWEST TERMINAL

THE Commission of Public Docks of the city of Portland, Oregon, have undertaken, in the construction of the municipal terminal number 4, to give the city of Portland one of the most modern and up to date terminal units that is to be found anywhere among the sea-ports of the world. The complete terminal will include five large piers and three slips with warehouse and open storage and with abundance of machinery for handling both mixed package and bulk cargoes, the whole covering an area of 160 acres and having a harbor frontage on the Willamette River of 2730 lineal feet.

When fully completed this terminal will have ample space for the berthing at one time of fourteen 500-foot vessels and will have a combined trackage of approximately 16 miles. Fifty acres adjoining the terminal are available for industrial sites with an ideal combination of rail and water service.

A large flour mill is under construction and will soon be operating on this ground immediately adjacent to the grain elevator of the terminal. This concrete elevator has a 1,000,000 bushel storage capacity and is equipped with machinery capable of delivering 20,000 bushels of bulk grain per hour to the holds of vessels at the pier.

The pier alongside this elevator has a length of 1500 feet and a width of 225 feet. The transit shed, 180 feet wide, extends the full length of the pier. Six hundred feet of this pier are constructed with two levels so as to take care of the handling of general cargo readily from a ship's deck at all stages of the water in

the river. The pier has a capacity to take care of 35,000 tons of general cargo or 56,000 tons of grain and flour. Slip number 1, lying between piers 1 and 2, is 280 feet wide, 2500 feet long, and will be kept dredged to a low-water depth of 32 feet.

Pier number 2, also 1500 feet long and 225 feet wide, has a transit shed 166 feet in width by about 750 feet long on its outer end, the inner end of the pier being open. Pier 1 is fitted with a very extensive rubber belt conveyor system for bulk cargoes, which transfers to the conveyor feeding the grain elevator.

Both pier number 1 and pier number 2 are equipped with a complete system of mains for pumping bulk oil and molasses directly from the holds of ships alongside the piers to storage tanks. The vegetable oil and molasses plant consists of eleven steel tanks having a combined capacity of 1,092,000 gallons, and two 60-ton scale tanks for the weighing of oils or molasses as delivered to the tanks from the vessel or as delivered to tank cars from the storage.

Piers number 3 and number 4, with slip number 2 between them, are to be finished as business demands.

Bulk Cargo Facilities

Pier number 5 was designed as a straight pier, 900 feet in length, with a quay running from its outstream end to the southerly line of the terminal. This quay and the fill back of it have been completed and elaborately equipped for the handling of bulk cargoes other than grain, such as coal, ores, etc. This quay is also arranged for oil bunkering.

The bulk storage bins on pier number 5 are largely of concrete construction and will have a total capacity of 16,000 tons. They are designed for the handling and shipping of phosphate rock, coal, sulphur and other such commodities. Here is the Ottumwa box car unloader, which picks up a full size box car loaded with bulk freight, opens its door, tips it first one way and then the other, discharges all of the contents, closes the door, and delivers the car on the track again, the total operation requiring seven minutes.

For the convenience of shippers and as a check on all shipping weights, a standard Fairbanks track scale with a capacity of 150 tons has been installed as part of the terminal equipment. This scale is operated under the supervision of the weighing and inspecting department of the Continental Freight Bureau.

Belt Conveyors

There are in connection with this pier number 5 over four acres of open storage space for lumber, structural steel, etc. A belt conveyor carries the bulk material from the bin at the car unloader to the storage bins. Trackage is also provided above the storage area and the storage bins, for the handling of bottom dump cars through a double-hoppered pit, with duplex shaker feeders discharging the material onto conveyor belts. Approximately 250 tons of phosphate rock or 150 tons of coal per hour can be handled in this way.

Belt conveyors equipped with portable spouts take material from the bottom of storage bins, and dis-

VIEWS OF PORTLAND'S NEWEST TERMINAL



Original ground before being broken for terminal site



Loading coal with the new conveyor system of the Port of Portland



Looking through one of the busy sheds of the municipal pier



Bunker facilities for bulk commodities



One of the conveyor belts for bulk commodities



A modern box car unloader



Portland municipal terminal number 1

charge onto traveling towers which are operated along the face of the pier and carry adjustable conveyors on swinging booms by which the material can be delivered into the hold of the vessel. This process can be reversed for unloading ships.

Fuel Oil Storage

In the rear of the bulk storage plant on pier 5 there has been installed a 55,000-barrel tank for fuel oil, with a 10-inch pipe line to the face of the quay at pier 5.

In the channel approach to terminal number 4 the port of Portland has excavated a channel the full width of the river, 1600 feet, with a minimum depth at low-water of not less than 30 feet, and the material obtained from this channel dredging was deposited on the site of terminal 4, about 80 per cent of which has now been raised to the required elevation.

This terminal is operated by the commission and they have built in connection with its operation an administrative building, a restaurant which has a capacity for seating 200 people at one time, and an employees' welfare building with clubrooms, showers and other conveniences.

The location of terminal number 4, while it is ideal from a standpoint of rail and water connection, is considerably removed from the main business and residence por-

tions of Portland. At the time of the beginning of construction work it was fully one and one-half miles from the nearest street car connection. The commission requested the extension of the street car system by the Portland Railway Light & Power Company, but that organization was unable to satisfactorily arrange its finances at the time to make the extension. The commission then procured franchises from the city and county and constructed the extension itself, placing the same in operation early in November. The greater portion of this street car extension lies on Kellogg street and its continuation, and the commission has had this street widened so that Kellogg street is now a paved roadway, 50 feet wide, connecting the terminal with the city of Portland.

Contemplated Improvements

The new terminal has become very popular with shipping on account of the splendid records made in loading and discharging cargoes from vessels. In fact, the use of this terminal has been so large that the Port of Portland Commission is working out at the present time a project looking to still further development of the channel of the Willamette, and has now proposed an engineering plan which contemplates the improvement of Swan Island and the west channel of the Willamette which,

if adopted and carried out, would give in Guilds Lake on the west side of the river railroad trackage facilities and terminal yards of 3000-car capacity, with pier slips and industrial sites covering 888 acres. On Swan Island, served on both the east and west sides by deep water channels, the plan calls for docks and industrial sites covering 160 acres. On Mocks Bottom there would be a long open dock facing on the east channel, with industrial sites back of it, served by railroad yards having the capacity of 2700 freight cars, covering 482 acres. This would give a total reclaimed area of 1530.79 acres. The plan contemplates the closing of the south end of the east channel by a railway mole which would give direct railroad service to the docks on Swan Island. It is estimated that the acquisition of the real estate and the cost of the dredging required would involve approximately \$5,000,000.

The outline of this plan as given here shows that the Port of Portland Commission and the business men of Portland are looking forward to a great expansion of business in the future and is one of the indications that there will be a great market on the Pacific Coast in the not far distant future for the activities of terminal engineers and the manufacturers of material handling machinery and equipment.



View of portion of Portland's waterfront from across the Willamette, showing part of the fleet of torpedo boat destroyers at anchor in the stream

EUROPEAN MARINE NOTES

Special Correspondence Pacific Marine Review

THE return of the British coal miner to work after having ceased all labors since April 1 is a good point for British shipping. This will be understood without any detailed explanation. A great deal of shipping will be freed and demand for tonnage is already good, especially for coal shipments. Steamers have been secured for the voyages to Italy, South America, Port Said, India, the Dutch East Indies, Denmark and Germany.

The reopening up of the coal trade will mean that British steamers will once again become scattered throughout the world. Ships which proceed to the East with coal cargoes will become available for loading home-wards grain and other foodstuffs. Owing to the curtailment of sailings from this country, the supply of ships in the Far East to accept homeward loadings has lately not been quite equal to the demand. There is no doubt in the minds of coal exporters and shipbrokers that British firms should be able to regain trade east of Suez. Centers which before the war relied on British coal have, during the past few years, been taking South African coal.

In Italy and South America competition from the United States is to be expected. Yet it is pointed out by a writer in the *Times* Trade Supplement that in Italy, at any rate, British coal should be delivered at prices below those for American coal. On the basis of a price of \$8 a ton for ordinary South Wales steam coal, and a freight of \$3.50 a ton, it should be possible to deliver British coal there at about \$11.60 a ton. Assuming a price of \$6 a ton for American coal, and a freight of a similar amount, American coal should cost at least \$12 delivered in Italy. But it is admitted that American firms have secured a strong foothold in this market, as well as in South America, and that the competition of American firms will have to be encountered. Both in the Italian and Egyptian markets, American exporters now hold large contracts, and to the extent of these the demand for British coal will be reduced. Freight rates for grain from the River Plate have been easier lately, and are likely to show a continued easy tendency should the demand for British coal from South America become of large proportions.

Sir Alexander Kennedy, president

of the Shipbuilding Employers' Federation, seized the occasion of the launching of a new oil tank steamer for the Argentine government to refer to the need for decreased costs in shipbuilding. He said that less than two years ago it was believed or at least hoped that the boom in shipbuilding and allied trades would continue for a few years. As events had proved the conditions then prevailing were economically unsound, and a slump, sharp and severe, came upon the shipbuilding industry. Instead of facing facts as they found them and suiting themselves to the altered circumstances, the cost of production was maintained at a level altogether disproportionate to market values. The attempt to adjust the difference led to industrial unrest, which in its turn delayed the completion of work. Some people seemed to think that the coal strike came just at a moment when trade was recovering. He was quite optimistic as to the future of British trade, but so far as shipbuilding was concerned, he was afraid there were no signs of recovery. Indeed, the indications were all in the opposite direction. He did not see how any of the great British industries could have recovered with the price of coal as it stood prior to the strike. With greatly cheapened coal there would be a chance for some of the large industries to get their productive costs down. At the same time until all costs fell considerably there would be no recovery. Costs in shipbuilding had undoubtedly fallen within the past few months, but they would need to fall still further before the acute depression in shipbuilding could be substantially relieved. Unemployment in shipbuilding at present was approximately 40 per cent.

Chamber of Shipping and Pilferage

There has now been issued the second interim report of the Chamber of Shipping and Pilferage committee, which deals with matters discussed by the committee since the first report was issued some weeks ago. Incidentally the present report throws light on one aspect of the phrase "Received for Shipment," sometimes employed in bills of lading in place of the time-honored phrase "Shipped in Apparent Good Order and Condition." The committee recommends that "The custom of issuing bills of lading for goods 'received for shipment,' except where the circumstances make no other

form appropriate, should be discouraged, as it gives scope for pilferage, and in no case should shipowners, under whatsoever pressure from merchants, issue a 'shipped' bill of lading until the goods are on board the steamer, as the difficulties of protecting the steamer against claims for pilferage which may have happened before shipment are thereby greatly increased."

Conditions at the Ports

A number of other matters dealt with by the committee include the acceptance by the London lighterage trade of the principle of some responsibility for the safety of goods carried; the institution of a special dock police scheme in London; the need for the better packing of cargo; and the revising of instructions to masters and officers of ships concerning the supervision of cargo confided to their care.

Emphasis is laid on a certain lack of assistance from harbor authorities throughout the world in checking the evil of pilferage. In this connection the committee writes: "In particular there is great difficulty at many ports in obtaining for the ships' officers a satisfactory account of the condition in which the goods are delivered out of their steamers, owing to the practice with many harbor authorities of intervening between the steamship and the consignee and taking the goods into shed or warehouse without any receipt or tally being taken or given until the goods are eventually delivered out of the shed to the consignee, which usually takes place some time after the steamer has left the port. The committee is collating exact information, with a view to seeing whether the chamber can take or promote any action to get a better state of affairs."

In conclusion, the committee, of which L. C. Harris is chairman, writes that "General proposition underlying our recommendations is the responsibility of the deck officers for the proper reception, carriage, and delivery ex-ship of their cargoes in good condition, and of the shipowners for giving every facility to the officers to perform these duties."

Australia's Merchant Fleet

W. M. Hughes, while in London for the Empire Conference, has the task prescribed him of investigating the position and outlook of the Commonwealth merchant fleet. When Mr. Hughes induced his cabinet to

adventure in state trading by purchasing the nucleus of a fleet of ocean-going steamers which should develop trade between Europe and America and Australia the headquarters of the fleet were located in London, and H. G. B. Larkin, then in charge of shipping affairs under the High Commissioner, was appointed general manager. Mr. Larkin has done splendid work in London in expanding the service.

When the five new boats now nearly completed, three at Barrow and two on the Clyde, are added to the rest the fleet will consist of over forty splendid modern cargo steamers fitted with the most improved mechanism for refrigeration, and effectually designed for carrying perishable produce to Europe from the Antipodes.

But private enterprise in shipping in Australia has opposed the state experiment all along and now the shippers have joined the shipowners on the ground that this state trading is too expensive and that freight rates are too high. The result just now is that Mr. Larkin has handed his resignation to Mr. Hughes in London. If the resignation is accepted it is probable that the Hughes government will sell the boats and abandon the state enterprise. I am informed, however, that Mr. Hughes, never deficient in pugnacity and daring, is unlikely to accept Mr. Larkin's resignation, and that he may endeavor to place the Shipping Department at Australia House on a stronger and more permanent basis than before during his visit. Mr. Hughes is now both Premier and High Commissioner.

German Shipping

The German merchant fleet in course of reconstruction is the subject of an article which appears in a recent issue of the *Bergwerks Zeitung* from a correspondent, who points out that it is recognized in Germany that the economic life of the country will be lacking in vitality so long as the nation does not possess a large merchant fleet. In his opinion the latter can only be restored by the construction of new ships in the native yards, as the German exchange is too unfavorable to permit of the purchase of foreign vessels, which are being offered in large numbers owing to the freight crisis, and it is mentioned in this connection that it was impossible for the German shipping companies to buy the ships recently offered by Scandinavian countries because the vessels were still too dear in view of the depreciated condition of the mark.

Under the circumstances every effort is being put forth to accelerate the construction of ships in the native yards, as the shipping companies despite the loss of their original sphere of activity are endeavoring to place new lines composed of German owned and built ships at the disposal of the foreign trade of the country. In this connection it is stated that the German East Africa Line will place a combined freight and passenger steamer in service in the coming autumn of a tonnage of 8000, which will be followed by two further cargo steamers by the end of the year, while the Woermann Line will also be able to incorporate in its fleet this year some new ships which are now in course of construction.

In addition a new ship has just been launched at the yard of the Deutsche Werft at Hamburg for the Hamburg-American Steamship Company; a freight ship has also been put in the water by Blohm and Voss at Hamburg for the German Australian Steamship Company, which has a number of vessels building to be placed in service jointly to be organized with the Kosmos Steamship Company; and the first freight ship built at the new yard of the Flender Company at Lubeck has also been launched for the Levant Steamship Company. All these shipbuilding schemes are being actively assisted by the various coal and iron and steel companies which are connected with the shipping companies of the shipbuilding companies either directly or indirectly.

Shipbuilding Decline

Shipping under construction in the United Kingdom on June 30 last was represented by 789 vessels of 3,530,047 tons, according to the returns of Lloyd's Register of Shipping. Of these vessels 715, representing 3,284,912 tons, were steamers, and 57 of 241,003 tons, were motorships. Seventeen vessels, of a total of 4132 tons, were sailing ships. The tonnage now under construction is less by about 268,000 tons than that being built at the end of the March quarter, and about 48,000 tons less than that under construction 12 months ago. The Register points out that under the present conditions, the figures can only be regarded as, to a large extent, nominal. As in the previous quarter, the total includes a considerable amount of shipping on which work has been suspended owing to the decline in the demand for tonnage, and also a large quantity of shipping the completion of which has been postponed owing prin-

pally to the stoppage of work by the joiners and the coal dispute. The tonnage on which work has been suspended amounts to 735,000 tons and the shipping which has been delayed in completion amounts to about 444,000 tons. These two totals, representing 1,179,000 tons, equal to one-third of the whole of the tonnage under construction, have to be deducted in order to enable a comparison to be made with the figures for normal times. There is thus given a real total of 2,351,000 tons under construction in the United Kingdom.

Attention was called in the two previous quarterly returns to the fact that, although the total tonnage returned as under construction was large, the amount completed compared very unfavorably with pre-war times. Whereas in 1913 the average amount of tonnage completed during each quarter was over 23 per cent of the total work in hand at the beginning of the quarter, the corresponding figures for 1920 fell below 13 per cent. There was a still further reduction during the past six months, the output for the period having fallen as low as 8½ per cent.

CONVEYORS

(Continued from page 532)

tion of these floor conveyors is about 300 feet long and is driven independently by a 10-horsepower motor. These conveyors are known as the west floor conveyors and they deliver to an inclined conveyor which takes the sugar up an incline of 24 degrees and delivers it to the north main belt conveyor. These same west floor conveyors by a short connecting conveyor can deliver sugar to another inclined conveyor which, ascending at 26 degrees, delivers to the south main belt conveyor.

The first mentioned inclined conveyor, known as the West, is about 42 feet from center to center of the sprockets. The other, known as the East, starts in warehouse number 5, runs parallel with the floor for a distance of about 130 feet and thence ascends at 26 degrees for 34 feet, making a total length of 164 feet between centers.

The east floor conveyor is set in a trough about 24 inches below the floor so that it may be covered over and sacks of sugar piled above it and still keep in operation.

This system of conveyors for discharging the warehouse can very readily handle 2000 tons of sugar in twenty-four hours or the maximum capacity of the refinery.

NEW STANDARD OIL TANKERS

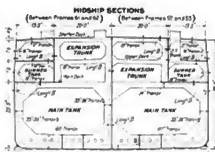
THE Federal Shipbuilding Company is fast completing the five shelter-deck bulk oil tankers building for the Standard Oil Company of New Jersey. These tankers, while modern in every particular, are of a fairly well standardized type and arrangement and are chiefly interesting in that they represent first-class present practice in this type of vessel.

They are 516 feet 5 inches in overall length, 68 feet molded breadth, with a loaded summer draft of 28 feet $\frac{3}{4}$ inch. The block coefficient is 0.803, the displacement tonnage 21,835, and the deadweight capacity in tons 15,920. The vessels are built on the longitudinal system to Lloyd's 100 A-1 special survey.

They are powered with three single-ended Scotch boilers 16 feet in diameter, 11 feet 6 inches in length, arranged for oil fuel with forced draft, having a total heating surface of 9618 feet. The working pressure of the steam is 210 pounds. The normal fuel consumption per day in tons is estimated at 41.25. These boilers deliver steam to two 3-cylinder triple expansion reciprocating engines (20½ by 35 by 60 inch cylinders by 42 inch stroke), developing a normal horsepower of 3320 at 90 r. p. m. The normal fuel consumption per horsepower works out at 1.16 pounds.

The engines drive twin-screws of the built-up type with semi-steel hub and three bronze blades. These screws have a diameter of 15 feet, a pitch of 14 feet 2 inches, and propel the vessel at 11½ knots an hour trial speed.

For auxiliary work one coal-burning donkey boiler is provided, designed for natural draft, and for steam at a working pressure of 180



Typical midship section of new Standard Oil tankers

pounds. This boiler has 1234 square feet of heating surface.

The hull is divided into ten main tanks, each tank 28 feet in length. There is a cargo hold forward 56 feet in length, and below it a deep tank for fuel oil. Aft of this cargo hold is No. 1 cofferdam; then follow three main cargo oil tanks; No. 2 cofferdam; three main cargo oil tanks; pump room; four more cargo oil tanks; cofferdam No. 3; fuel oil tank; cofferdam No. 4; and aft of cofferdam No. 4 the boiler and engine rooms.

As will be noted, in the midship section summer tanks are carried outboard of the expansion trunks. The total capacity of the ten main cargo oil tanks is 110,441 barrels. The total capacity of the six summer tanks is 11,014 barrels, giving a grand total on summer freeboard of 121,455. The cargo hold has a total cubic space of 75,514 cubic feet for grain and 67,983 cubic feet for baled cargo. The fuel oil tanks have a capacity for 12,488 barrels, giving at the trial a speed of 11½ knots a cruising radius of 11,400 nautical miles.

The auxiliary equipment and machinery includes three steel pole masts, two steel derrick posts, three

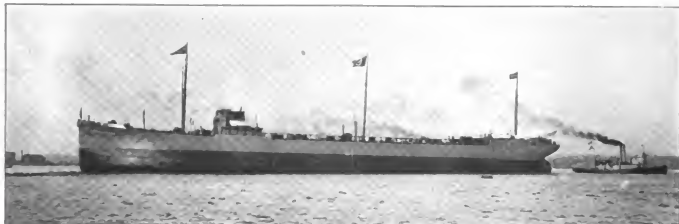
5-ton booms, and two 3-ton booms, served by three steam winches. There is one double steam winlass 16 by 12, and one steam tiller with tele-motor. For pumping cargo two 3000 barrel per hour steam driven compound horizontal duplex pumps are provided and one duplex drainage pump 10 by 6½ by 16 inches with 6-inch auxiliary discharge.

The main tank suction consists of a 14-inch main line on each side of the center line bulkhead with 10-inch suction to each tank. This main line is cross-connected at the pump room. The main tank discharge consists of a 12-inch main on the port side extending from the pump room aft along the upper and shelter decks to abaft the end of the engine room casing.

Ample accommodations are provided for a crew of fifty-one men, with one spare stateroom, a fully equipped hospital, adequate electric light installation, refrigeration rooms for galley supplies, and efficient fresh water, sanitary, and steam heating systems.

ANNOUNCEMENT

THE official report of the Eighth National Foreign Trade Convention is now ready for distribution. This volume forms the most convenient encyclopedia of up-to-date authoritative material on foreign trading matters from the American viewpoint. It is, therefore, highly important as a reference work for every American merchant because in the present condition of world finance the business of every American merchant is necessarily affected by world trading conditions, and he should thoroughly acquaint himself with these conditions.



Standard Oil tanker E. T. Bedford just after launching

BOOK REVIEWS

Merchant Vessels, by Robert Riegel, assistant professor of insurance and statistics, University of Pennsylvania; 260 pages, with numerous diagrams, maps, tables and cuts, completely indexed, bound in red cloth with gold stampings. Published by D. Appleton & Company. Price \$4 net.

This is the fourth volume of a series dealing with the business of ocean shipping and transportation and is designed as a textbook basis of ocean traffic. Part 1 deals with the construction, type and uses of merchant vessels. Part 2 deals with the measurement of merchant vessels. The book makes no pretense to being in any way a treatise on the theory and practice of naval architecture. The treatment is intended to be economic. In other words, the forms and types of merchant vessels are analyzed in this book with regard to the manner in which they fit into the present economy of the management of ocean traffic. The book therefore should be used in connection with the other volumes of the series.

The second section, dealing with measurement of merchant vessels, is a very important contribution to the literature connected with that subject, which has in the past been largely confined to government documents and to works in foreign languages. This part of the book will be found of great use by students of ocean traffic and by others whose business it is to ship freight on board American vessels. The principles underlying American measurement rules are treated very exhaustively and the differences be-

tween American rules and those applying on ships of other nationalities is plainly set forth.

On the whole this book is a decided addition to American literature on ship management.

Johnson's Steam Vessels. The 12th annual edition (1921) of Johnson's Steam Vessels has just been received.

This publication, which made its initial appearance in 1910, and at that time and for several subsequent years gave a list of steam vessels in New York harbor, has grown until

now, in the 1921 edition, it covers the Atlantic, Gulf and Pacific Coasts and Great Lakes.

It gives, in such form as to be convenient and instantaneously available, the owner, name, age, material, type, hull dimensions, tonnage, engine and boiler dimensions, and classification society of practically every steam vessel of American registry, and should prove of inestimable value to all interested in ships or shipping.

Johnson's Steam Vessels, the price of which is \$10 per copy, is published by Eads Johnson, M.E., Inc., 115 Broadway, New York.

A Well Deserved Honor

IT will be of great interest to marine electrical engineers to learn that the Albert medal of the Royal Society of Arts has recently been awarded to Dr. John Ambrose Fleming.

Dr. Fleming for the last forty-two years has been closely associated with practical and scientific developments in the application of electricity. As far back as 1879 he was scientific advisor to the Edison Telephone Company of London, and during the decade from 1882 held a similar position in connection with the Edison Electric Light Company in London. During 1882 he installed electric lights on an Indian troopship for the Royal Navy. This is said to have been the first marine installation.

In 1899 he was intimately connected with the practical development of the Marconi system of wire-

less telegraphy, and in 1904 he invented the first form of the thermionic valve, which in its later improved forms has effected such a revolution in wireless telegraphy and telephony.

Dr. Fleming has always been a voluminous contributor to transactions of scientific and engineering societies. He is the author of sixteen text-books on electrical subjects, and for thirty-six years has held the chair of electrical engineering in the University of London.

Just recently he has completed and is publishing a book entitled, "Fifty Years of Electricity—The Memoirs of an Electrical Engineer," which is on the press now at the Wireless Press, Limited, London. This book should prove of great interest to all who keep abreast of modern development of electrical science.

Marine Equipment Association

At a meeting of the executive committee of the Marine Equipment Association of America held in the office of the president, Colonel Edward A. Simmons, Woolworth Building, New York City, on July 21, it was decided to hold the first annual exhibit at the Central Mercantile building, New York City, during the week beginning November 14 next.

The Central Mercantile building, more familiarly known as the Greenhut building, is located on the east side of Sixth avenue, between Eighteenth and Nineteenth streets. For some years it was occupied by retail dry goods store and during the war taken over by the War Depart-

ment and used as a hospital for sick and wounded soldiers returned from overseas. Each floor of the building contains more than 80,000 square feet of space with a floor load of 190 pounds per square foot. The first floors have been laid out by the Manufacturers' Exhibition Company, Inc., for permanent exhibits of machinery and mechanical appliances much like the one that has existed in the Bourse building, Philadelphia, for several years. The marine show will be held on the third floor, and all exhibits will be installed under the direction of the exhibits committee of the association, of which W. M. Wampler of the Coen Company is chairman. Applications for space

as well as for membership in the association should be addressed to the secretary, K. L. Ames, Jr., American Steel Foundries, McCormick building, Chicago, Illinois.

The by-laws of the association provide that only members may exhibit. The annual dues are \$25 a year, and each exhibiting member will be charged a given price per square foot for such space as he may contract. The cost for this year has not yet been determined.

It is the plan of the association to lay out the exhibit spaces in given standard units of uniform design, which may be easily put up, taken down and stored, and to buy and

own all of the material for use in future years.

The action of the Marine Equipment Association in deciding to exhibit during the week in which the Society of Naval Architects and Marine Engineers will hold its annual convention, and the appointment by the council of that society of a committee consisting of Captain C. A. McAllister, chairman; J. Howland Gardner, W. H. Todd, H. H. Raymond and F. L. DuBosque, to act with a like committee of the Marine Equipment Association in laying out a joint program for a big "American Marine Week," will mean much to the shipbuilding industry of this country directly, and will also stimulate public interest in the American merchant marine. Also the American Society of Marine Draftsmen have changed the date of their annual meeting to November, and it is believed that other organizations in the marine field will decide to meet during that week.

The members of the executive com-

mittee are: New England district: E. B. Williams, manager marine department, B. F. Sturtevant Company, Boston, Massachusetts, and F. L. Andrews, vice-president, Hyde Windlass Company, Bath, Maine. New York and New Jersey district: M. L. Katzenstein, manager marine department, Worthington Pump & Machinery Corporation, New York; W. M. McFarland, manager marine department, Babcock & Wilcox Company, New York; H. C. Davis, treasurer, Row & Davis, Engineers, Inc., New York, and Frank Hatch, vice-president, Shepard Electric Crane & Hoist Company, Montour Falls, New York. Pennsylvania, Maryland, Delaware, District of Columbia, Virginia and West Virginia district: G. W. Selby, secretary-treasurer, Marine Decking & Supply Company, Philadelphia, Pennsylvania; J. C. McQuiston, director of publicity, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pennsylvania; William Stayton, president, Baltimore Steamship Company, Baltimore, Mary-

land, and W. P. Smith, superintendent of sales, William Cramp & Sons Ship & Engine Building Company, Philadelphia. South Atlantic and Gulf States district: Paul Jahncke, vice-president, Jahncke Dry Docks & Shipbuilding Company, New Orleans, Louisiana. Great Lakes district: F. C. Bradbury, manager marine department, Crane Company, Chicago, Illinois; J. D. Sarles, manager marine department, Pyle-National Company, Chicago, Illinois; H. L. Hibbard, manager marine department, Cutler-Hammer Manufacturing Company, Milwaukee, Wisconsin, and J. H. Redhead, assistant manager of sales, National Malleable Castings Company, Cleveland, Ohio. Pacific Coast district: W. M. Wampler, Eastern manager, Coen Company, San Francisco, California, and H. F. Alexander, president, Pacific Steamship Company, Seattle, Washington.

The finance committee consists of W. M. McFarland, Babcock & Wilcox Company, chairman, and J. R. Tiebout, Jr., of W. & J. Tiebout.

MARINE RULES

Recommended Practice for Electrical Installations on Shipboard

THE differences between the requirements of various classification societies and insurance companies in regard to electrical installations on shipboard and the lack of any accepted standard engineering practice for marine installations led the American Institute of Electrical Engineers in 1913 to appoint a committee on the use of electricity in marine work, now known as the Marine Committee. This committee besides arranging for papers to be read at the meetings of the institute to increase the interest of electrical engineers in marine problems, also took up the preparation of the standardization rules which would represent good engineering practice, and which might be accepted by the classification societies. As a result, a set of rules was prepared covering two important divisions; namely, fire protection requirements, and marine construction requirements. The first part related primarily to dangers that might arise from fires, and the second part had to do purely with the preservation, maintenance and operation of the electrical plant in its exposure to the conditions existing on ship board.

These rules were adopted by the

committee of the American Bureau of Shipping and were published as Section 37 of the rules for building and classing vessels, issued by that bureau.

The first edition of the rules did not cover the entire field of the use of electricity on ship board, and the committee was, therefore, continued in force, and a more nearly complete set of marine rules has now been prepared. The committee has made a careful comparison of the rules issued by the American Bureau of Shipping, the National Board of Fire Underwriters, the Steamboat Inspection Service of the United States Department of Commerce, Lloyd's Register of Shipping, the Institution of Electrical Engineers, Bureau Veritas, Germanischer Lloyd, and Verband Deutscher Elektrotechniker. With several of these associations correspondence and personal conferences were carried on.

Certain mechanical signaling systems are included, as it is the custom of many shipyard electrical engineers to supervise the installation of mechanical signaling equipments as well as the electrical plant.

To insure a careful consideration of these rules sub-committees were appointed to cover various branches of the work, and after each sub-committee had considered its own rules, they were submitted for discussion to the entire committee, after which they were referred to an editing

committee of four members to arrange them in suitable form for publication. It is not to be expected that this edition of the rules contains everything that might be of value to electrical installations on ship board, and it is expected that later editions will be prepared which will be more complete and will include electric propulsion.

In the meantime, any questions concerning rules, which appear to be of doubtful meaning, may be referred to the chairman of the Marine Committee of the American Institute of Electrical Engineers, 33 West Thirty-ninth street, New York City, and the committee invites suggestions for improvements or amplifications of these rules.

No definite arrangements have yet been made for the approval of apparatus and accessories, but it is expected that through the co-operation of the underwriters' laboratories, arrangements will be made later by which apparatus or appliances used on shipboard may be inspected and approved.

In the absence of approved standards for merchant ships appliances approved by the Navy Department will in general be satisfactory.

Bound copies of the rules may be obtained at \$1 per copy by addressing American Institute of Electrical Engineers, 33 West Thirty-ninth street, New York, N. Y.

MARINE INSURANCE

(CHARLES F. HOWELL, Eastern Contributing Editor)

Collapse of Hull Agreement

When the British Joint Hull Agreement was abrogated in the majority of its essentials a short time ago, underwriting of hulls received the most staggering blow it has had to stand up under for many years. The agreement has been the mainstay of British marine insurance for the past decade and represented the culmination of countless conferences and experiments; to restore it, now that it has been formally scrapped, is going to be just about as difficult a bit of diplomacy as securing it in the first place. Among its cardinal advantages was a maintenance of rates and valuations.

Shipowners had been centering an attack upon the agreement for the better part of a year, and they came near to finishing it six months ago, when a temporary compromise was effected that turned out to suit nobody, but staved off defeat for the time being. In spite of those concessions friction had been present right along in the London market between the insurance companies and the underwriters at Lloyd's, and at last the break has come.

Everything is now wide open as respects rates, values and the famous "lead"—which is the first name on the broker's slip of acceptances. It is an ill wind that blows nobody good, and the shipowners are going to reap a harvest, as the keenness of competition among marine insurers guarantees their getting just about all they want in the line of low rates and valuations. Indeed, this has already come about. The more conservative underwriting offices are preferring to let old-established business go off their books rather than fall in line with the reckless new-comers and long-chance takers in the mad scramble for premiums. In the absence of much in the way of reserves, the newer offices have to gather in the premiums if they are to keep going, and they are certainly sticking at nothing. About all that is left of the old agreement is the 30-day return period arrangement and the 15 per cent disbursement clause. The old-timers are pinning their sole hope to the disbursement clause in the fight for adequate valuations in these days of heavy repair charges.

Load Line Agitation

No one subject has been receiving

closer attention at the hands of underwriters and shipping interests during the past month than that of the determination of adequate load lines for American vessels. Bills on this important phase of our maritime development are before the House and Senate, the latter body waiting upon preliminary action by the former. These legislative proposals are practically identical with those introduced in Congress last year, when the House passed its bill and the Senate defeated it. Interest during the past month has been centered in the hearings before the House committee that has the bill in hand, the merchant marine and fisheries. Representatives of every interest affected have been on hand, presenting their sides of the case. Commissioner of Navigation Chamberlain opened the hearings by stating that the bill is a department measure and accordingly thoroughly approved in that important quarter. Marine insurance was then given its day in court, with accomplished spokesmen in the persons of S. D. McComb, manager of the Marine Office of America; W. D. Winter, third vice-president of the Atlantic Mutual Insurance Company; and Galloway C. Morris, third vice-president of the Insurance Company of North America. It was pointed out that the majority of the civilized nations of the world already have load line regulations covering vessels arriving at and leaving the ports of those nations, and that such agreements carry with them reciprocity features under which each government respects the regulations of the other. America having no load line laws whatever, is without this reciprocity protection for its seamen and maritime property and lies supinely subject to whatever action foreign nations may feel disposed to exercise toward our nationals. During the war England entered into a temporary agreement to keep hands off our ships in this respect, but the war is over and so is the agreement. This reciprocity feature is embodied in the pending bill.

The real function of freeboard legislation and of freeboard rules and regulations is to find and enforce a just mean in the loading of vessels, holding in due regard on the one hand safety to life and property, and on the other the natural and proper desire on the part of the

owners to realize the maximum of service from a given ship. The dilemma has two horns: undue limitation in loading entails restriction in a ship's earning capacity, and, consequently, a national loss in tonnage capacity; but, on the other hand, reduction in freeboard within the reasonable limits of safety to life and property becomes a national asset because of the increase in tonnage capacity. The question therefore is: What is a reasonable regard for life and property? This is really an actuarial problem; lack of freeboard is only one of many causes that contribute to the sum total of marine casualties. This contributory hazard should be reduced to the lowest limits compatible with a reasonable regard for the functioning of a ship as a tonnage carrier. The basis is a strength calculation, precisely as in the case of girders, for example. It most certainly should not lie with the discretion of ship masters, as some opponents of the bill maintain, any more than an elevator starter should decide how much weight his elevator can carry. The scientific experts who built the elevator are the only ones who know that, and they stipulate it in placards that hang in every lift. Thus the bill would protect careful owners against competitive advantages secured by unscrupulous owners; the latter, by over-loading, can make more money through more rate on cargo carried, and so put the former out of business, as the overhead of running a vessel is the same no matter how loaded. In a word, it equalizes the earning capacity of similar boats. Nor should the owner object, because there is a provision in the bill for his appealing against the regulations in his case should they prove unsatisfactory.

The measure states that the regulations are to be provided by the secretary of commerce, so no man knows just what they are to be, except that they will have to conform with the general recommendations of the bill. That an international conference on load lines is desirable and certain to come in a few years is apart from the substantial facts that if we wait until then we will not only remain subject to the whims of other nations in restraining our men and ships when in their ports with no recourse on our part, and that we are without this protection

FIREMAN'S FUND

Insures Hulls, Cargoes,

HEAD OFFICE: CALIFORNIA AND SANSOME

JOSEPH HADLEY, European Agent
1 LOTHBURY, E. C.
LONDON

E. A. VALENTINE, Special Agent
714-715 BOARD OF TRADE BUILDING
PORTLAND, ORE.

FRANK G. TAYLOR, GENERAL AGENT FOR WASHINGTON, OREGON, ALASKA

to American life and property in the interval, but, what is of equal importance, we should have to enter such a conference with no load line laws of our own and with nothing practical to submit for our side of the case and be compelled to accept a pre-arranged set of regulations submitted by foreigners and nicely suited to their particular requirements. For there are differences between the conditions that surround vessels of the American mercantile marine and those of the leading European nations; and the major and minor departures from the rules and methods of procedure, as set forth in the British Blue-book, such as will, if this bill is passed, be introduced into our load line laws, may be depended upon to be not only fully justified but to represent distinct advances of a character worthy of the deepest consideration from the point of view of the commerce of the world.

Harter Act Under Fire

Interest in the progress of the load line bill is but slightly greater than that taken in the broadside attack upon the Harter Act, still in progress. Marine underwriters, shippers and shipowners have been down to Washington and had their say before the House committee on merchant marine and fisheries, the subcommittee of which has a revision of the measure under consideration. The ostensible subject of the hearings is the enormous losses to waterborne cargoes in the matter of theft, pilferage, breakage and short deliveries; but it did not take long to uncover the Harter Act as the real cause of all the trouble. Congress proposes a sweeping inquiry into shipping losses through thievery, and the introduction of remedial legislation, a resolution to that effect having been adopted at the instance of Representative Edmonds of Pennsylvania.

In the very first days of the hearings more than sufficient evidence was introduced by marine underwriters and shippers to establish a serious case against the Harter Act. "Passing the buck" to the underwriters, under the working of this extraordinary piece of legislation, has not got anybody anywhere. The demand is persistent that it be amended so as to hold shippers and shipowners liable for full amount of damage done; at present it merely grants owners exemptions that they never could have had under common law, which holds employers liable for the negligence of their servants. A sub-agreement is regularly made by the owner with the shipper naming the former's liability at the nominal figure of \$100, and there is no redress by way of the courts. This was proved once and for all in the celebrated suit brought before the Supreme Court by the International Mercantile Marine a few years ago. The owners frankly acknowledged that they were liable under the Harter Act, but stood on their right to make a sub-agreement with the shipper fixing the financial responsibility at a definite figure. The Supreme Court could do nothing more than O. K. such an arrangement, and the Harter Act became a joke. It has been styled the bulwark of all shipowners in contesting liability for cargo losses. Samuel Bird, Jr., of the New York firm of Talbot, Bird & Company, puts the situation in a nutshell when he says: "If Congressmen Edmonds can possibly enact legislation that will place the responsibility on the common carriers and prohibit them by law from limiting their liability, the committee on merchant marine and fisheries will do something that will assist greatly in relieving the situation. If the Department of Justice will follow up depredations under the Federal laws, this also will be a

helpful factor."

Court interpretations and decisions, along with state statutes, have completely divested the act of its initial benefits to shippers and underwriters. It has been a surprise to many to note with what unanimity the shippers followed one another in denouncing the effect of the act upon their interests. Among the underwriters who appeared before the committee were President Benjamin Rush of the Insurance Company of North America; F. H. Osborn, Eastern marine manager of the Fireman's Fund; William D. Winter, third vice-president of the Atlantic Mutual Insurance Company; Samuel D. McComb, manager of the Marine Office of America; and Wade Robinson, of Wade Robinson & Company. President Rush summarized the situation admirably as follows:

When the common carriers were held to their strict responsibility, and were not allowed to indirectly evade it by means of reduced valuation clauses, notice of loss clauses, and various other bills of lading clauses which have been introduced by them for the express purpose of avoiding their full responsibility to the shipper, they took very good care to see that they had honest employees and to enforce discipline on their vessels, and in the men engaged in loading and unloading cargo, but under the law as interpreted by the courts at present, it is very much cheaper for them to pay the small nominal damage, provided in the released bill of lading, in the event of a claim, rather than put in effect an adequate system of supervision and care, which would result in the elimination of the theft, pilferage, breakage and non-delivery which is now sustained by merchants, who are forced to ship under the various terms of the released bill of lading, or not ship at all.

American Bureau Appointment

Commander Frank D. Baldwin, a retired engineering officer of the United States Navy, has been ap-

INSURANCE COMPANY

Freights and Disbursements

STREETS, SAN FRANCISCO, CALIFORNIA

W. H. WOODRUFF, Special Agent
LOS ANGELES
230 BYRNE BUILDING

F. H. & C. R. OSBORN, Managers
ATLANTIC MARINE DEPARTMENT
72 BEAVER STREET NEW YORK

AND BRITISH COLUMBIA, 309 COLMAN BUILDING, SEATTLE, WASHINGTON

pointed exclusive surveyor of the American Bureau of Shipping at the port of Valparaiso, Chile. He was the first American naval officer sent to France during the late war. Retiring from the service eight years ago, he has since secured a varied and successful business experience. He was formerly assistant to Robert L. Hague, head of the marine department of the Standard Oil Company, when the latter was superintendent of construction and repairs for the Shipping Board. He is rated as a first-grade authority and the Bureau is to be congratulated upon securing his services.

Inland Liability Decision

Justice McAvoy of the New York Supreme Court has rendered an important decision in a suit brought by Guy M. Walker vs. The Liverpool & London & Globe Insurance Company, and the same vs. The Western Assurance Company, on the question of liability under an inland form of marine policy when the damage has been unrepaired. Underwriters regard this as a decision of the first importance. The opinion of the justice was as follows:

The vessel involved was damaged as a result of a marine peril and defendants, her assurers, contest payment of the estimated damages found upon a survey because of this clause in the marine policy: "No claims for loss or damage shall go beyond the extent or cost of actual repairs rendered necessary in consequence of disaster insured against." If this be construed as a clause conditioning liability upon the actual making of repairs and thus reaching a definite determination of their cost, the plaintiff must fail, for concededly there never were actual repairs made of the damage to the vessel. Per contra, if construction be that the words taken in their collocation with other phrases anterior import merely a limitation of the sum of loss beyond which liability will not be incurred, the finding must award the conceded survey estimate as judgment dam-

ages. The rule of maritime jurists as to liability of insurers is that the vessel's owners or the assured should receive the amount of estimated damage at the port of distress regardless of the fact that actual repairs might be made for a lesser sum at another port to which the vessel could be towed or proceed upon her own motivation (Pitman v. Universal Marine Ins. Co., 9 Queen's Bench Div., 192; Ins. Co. v. Southgate, 5 Peters, 604.) This rule, of course, may be averted by specific agreement of the assured and insurer to adopt another media of liquidating damage, and such a change, it is asserted here, has been accomplished. This upon a mere reading of the clause quoted would appear plausible, but on the whole policy's purpose of indemnity it is unsound. The theory that an assured is limited to the amount paid for actual repairs would lead to the absurdity that if he made no repairs at all and used the vessel in her damaged condition he could recover nothing (The Keeler, 194 Federal, 342). The survey provided for in case of damage in such an instance would be useless; else why survey when actual cost of actual repairs is the sole criterion?

Salvage Association Appoints

Appointments of agents to act on behalf of Syndicate A of the American Marine Insurance Syndicates and/or its successor, the United States Salvage Association, are announced as follows by Charles R. Page, manager:

Alexandria, Egypt, Gill & Company, No. 4 Rue Adib. Gill & Company is a partnership consisting of Henry C. Gill, American; William Yale, American, and Felix Cohen, an Egyptian. They are engaged in the general business of steamship agency brokerage and the exporting and importing of American merchandise. The two American members of the firm have been highly endorsed to us from very responsible sources.

Naples, Italy, J. P. Spanier, Spanier building, via Marina Nuova. Mr. Spanier is a native American who has been engaged in the shipping

business in Naples for a great many years; is a man of unusually high standing with the Italian people, and is agent for many different American enterprises, including that of several shipping firms.

Port-of-Spain, Trinidad, Grell & Company, Ltd., Port-of-Spain, Trinidad. This firm has been, for a number of years, agents of the Board of Underwriters of New York.

Honolulu, T.H., Bruce Cartwright, 35 Merchant street. Mr. Cartwright has been the agent of the Board of Underwriters of New York, and the National Board of Marine Underwriters, for several years past.

Poznan Libel Stands

Judge Learned Hand of the United States District Court has rendered a decision in the libel suit brought by several score shippers against the steamer Poznan, which returned from Havana last year without discharging the cargo she had taken out of New York, although she stopped thirty-three days in the Cuban port. Full damages were allowed, in the total sum of \$1,500,000, the claims being for non-delivery of cargo, defective loading, and theft and pilferage losses at the Brooklyn wharf after the vessel's return. The ship and its charterers, the Acme Operating Company, were held for the theft and pilferage losses, and damages also were assessed against ship, charterers and the owners, the Polish-American Navigation Company, on the theory that the latter caused the return of the vessel. This decision has given the underwriters immense satisfaction, as, unless it is reversed on appeal, they will receive a refund of at least a portion of the amount which they have advanced in settlement of the Poznan claims. Judge Hand held that even though the bill of lading contained a stipulation giving the charterers the privilege of returning with the cargo to the home port, nevertheless such a radical deviation constituted an abandonment of the voyage.

A Bad Month

During the first few days of August the Pacific was the scene of casualty after casualty, the aggregate of which ran into large sums, although no individual loss was half so large as that of the steamship Governor in April. From all standpoints the most serious disaster was the sinking of the Alaska Steamship Company's Alaska, under charter to the San Francisco & Portland Steamship Company, which struck Blunts Reef, near Eureka, California, August 6, with the loss of thirty-eight lives. Three days later, on August 9, the Pacific Mail steamship San Jose struck on Asuncion Island, off the coast of Lower California, and will be, from an underwriter's standpoint, a total loss. The third large vessel sunk was the C. G. M. M. Canadian Exporter, which grounded at Willapa Harbor July 31 and broke in two a few days later.

\$334,000 on Alaska

Pacific Coast underwriters did not suffer a severe loss on the Alaska, as only \$30,000 of a total of \$334,000 was placed in the West, the remainder being carried in New York and London. The amount of cargo insurance was of course more difficult to ascertain, especially in view of the loss of the manifest. Advertisements published in the newspapers invited attention to a large quantity of flour, which would have a good salvage value but which probably would not be worth the expense of recovery. The vessel foundered in eighteen fathoms, which is by no means deep for diving, men from the Brooklyn Navy Yard having gone to fifty-two fathoms in salvaging the U. S. S. submarine F-4, lost off Honolulu in 1915. The Alaska was an iron and steel vessel of 3709 tons gross and was built by the Delaware River Company, Chester, Pennsylvania, in 1889.

A great deal of discussion appeared in the newspapers regarding the loss of the Alaska, with a consequent and immediate reaction on coastwise passenger business, which slumped badly. The principal criticism made of Captain Harry Hobey, who was among the lost, and of the Alaska & Portland Steamship Company was that the vessel was purposely run close to the reef in a heavy fog in order to save time and fuel. Other charges made by passengers and crew were that no soundings had been taken, although one of the officers had asked the master whether they should be, and that the crew was undisciplined and inefficient. The four surviving deck

officers were charged with inefficiency and unskillfulness by the local inspectors at San Francisco. The British steamship Anyox, commanded by Captain S. Snoddy, saved most of the passengers and crew by steaming at full speed through a heavy fog.

15,000 Bags of Coffee

The San Jose was operated in the Panama service of the Pacific Mail. She was an iron vessel of 2135 tons gross and was built at the Roach yard, Chester, Pennsylvania, in 1882. All her passengers were taken off and the steamship Griffidu took 1911 bags of coffee and 48 bales of hemp. Indications were, however, that cargo loss would exceed \$200,000, as the vessel had 15,000 bags of coffee besides hemp and concentrates. No hull insurance had been placed on the Pacific Coast and the amount carried was not stated. About \$120,000 was spent on the vessel a year or so ago. Captain C. Zastrow was in command.

The loss of the Canadian Exporter at Willapa was the first major disaster of the Canadian Government Merchant Marine. Details of her cargo loss were not clear, but only a small amount, from \$5000 to \$10,000, had been placed in San Francisco. Lumber was the principal item. She was close inshore when she struck, although a contributing factor may have been faulty compasses, of which Captain William Bradley said he had complained.

Some Other Casualties

Among other casualties, all unim-

portant when compared with the three listed, are: U. S. S. B. Effingham, aground in the Columbia River July 20, repairs \$35,632, about 800 tons of flour damaged; ship Golden Gate, owned by Mayor James Rolph, San Francisco, aground near Cristobal, pulled off, damage undetermined; schooner Ottillie Fjord, ashore near San Francisco, pulled off and libeled for \$20,000; steam schooner Multnomah, propeller lost off Blunts Reef; Canadian Pacific steamship Princess Ena, aground north of Vancouver; U. S. S. B. Hawkeye State, boiler damage, for which her engineers were suspended after trial.

Repair Costs Lower

A grain of comfort (and a large grain indeed) for the underwriter is discoverable in the case of the United States Shipping Board steamship Effingham, which was operated by Williams, Dimond & Company in their European-Pacific Line. She grounded in the Columbia River in July. In addition to minor repairs, the following major repairs were necessary: renewal of four shell plates on the port side, seven on the starboard; fairing of two shell plates on the port side, three on the starboard; renewal of keel plate to first butt aft of the stem; renewal of forefoot; renewal of stem from forefoot to first scarp as originally fitted; renewal of all floors forward of the forepeak except one, which was to be repaired; renewal of centerline longitudinal girder forward of the forepeak bulkhead.



Side view of damaged bow of the U. S. S. B. Effingham, repaired for \$35,632

A contract for this work was awarded to the Albina Marine Iron Works of Portland for \$35,632, which was the most satisfactory bid, although not the lowest. The same job a year ago probably would have cost between \$50,000 and \$60,000. A marked reduction in repair costs is thus apparent; not only that, but the disparity between low insurance valuations and high repair costs tends to become less.

Other bids ranged from \$25,382, Todd Drydocks, Seattle, the Shipping Board to move the vessel to Puget Sound and bear insurance during the voyage, to \$55,680 of the Pacific Marine Construction & Repair Company. The Todd yard bid \$38,288, the contractor to move the vessel and assume insurance.

A New Firm

J. A. Mathews, Pacific marine general agent of the Aetna Insurance Company, and S. A. Livingston, appointed his assistant in June, have organized the partnership of Mathews & Livingston. This firm will act as Pacific Coast marine agent of the Universal Insurance Company, Newark, New Jersey, and of the Franklin Fire Insurance Company, Philadelphia. In organizing the firm and taking the Universal and Franklin agencies, Messrs. Mathews and Livingston wished to increase their lines so as to be able to compete more successfully with other agencies of San Francisco, some of which represent many companies and accordingly are in a situation to accept large risks, of which a one-company agency could take only part. The Aetna agency is not affected. Offices of Mathews & Livingston are at 340 California street, where the Aetna offices also are located.

The Universal Insurance Company has capital of \$400,000, surplus of \$200,000, and surplus to policyholders of \$600,000. Talbot, Bird & Company, New York, are general managers of the Universal and also represent the Aetna in New York. Samuel Bird is president of the Universal. The Franklin company has not been represented in the marine field in San Francisco prior to this time.

Governor Decision

Captain William Fisher, supervising inspector of the Steamboat Inspection Service for Washington and Oregon, has handed down a decision suspending for two years the license of Captain John Alwen, master of the steamship West Hartland, which rammed and sank the Pacific Steamship Company's liner Governor in Puget Sound April 1. This decision is at direct issue with that of the



The Eftingham from ahead

local board, which exonerated Captain Alwen. Said Captain Fisher:

Having delayed giving a signal until too late, Captain Alwen blew one blast signifying that he would hold his course and speed and then immediately put his engines full speed astern. In other words, having claimed his right of way and immediately receiving a signal from the Governor that she was backing full speed, Captain Alwen, instead of keeping his signified course and speed, also backed up and thus kept the two vessels in the same relative situation. As justification for his action, Captain Alwen and his counsel cite the rule applicable "in extremis," which permits disregard of rules when collision is imminent. He is, however, in this dilemma: As heretofore noted, his whistle and signal to the engine room were almost simultaneous. If the ships were then "in extremis" there remained no opportunity to maneuver after the first whistle was blown, and Captain Alwen stands self-convicted of unwarranted delay in sounding some signal. Contrary to this is the testimony of Captain Alwen that he was backing for nearly two minutes before the collision, had taken about a knot off his speed and had time to signal the Governor of his changed intention. If this be true, then Captain Alwen went contrary to his expressed intention, failed to signify a change and thereby contributed to the disaster.

The privileged ship is not free to proceed into a dangerous situation or act in disregard of the maxim—"Safety First."

The decision of the local board puts, it seems to me, too broad an application on the well known rule that the ship having the right of way shall hold her course and speed. Even should it be conceded that a ship whose speed is constantly accelerat-

ing comes within the rule, though the nature of her maneuver is unknown to the burdened ship, yet it cannot be said that "all she (the privileged ship) need do is do nothing." Such a rule would encourage disregard of the sacred obligation to preserve human life, and would, if literally pursued, result in an attitude on the part of those inclined to recklessness which would constitute a menace to safe navigation. While this proceeding is not in any sense a lawsuit—on the contrary, it pertains solely to a license issued by this department—yet it is proper to note that the highest legal authority has frequently recognized that the privileged ship, as well as the burdened, is bound to use all possible skill and prudence to avoid putting human life in danger; and when danger looms ahead the officer in charge must exert caution and skill in the discharge of his important duties. In this case every consideration demanded that an understanding be had as to the Governor's intention before the point of danger was reached. From a background of high land with many bright lights and deep shadows, Captain Alwen was putting out with his deep laden 8800-ton turbine ship; she was down by the head 1 foot 3 inches; she steered sluggishly; the Governor appeared and took a course that put him in doubt; a situation of danger was developing. Would she cross in front or behind him? The mere sounding of his whistle would determine it, yet he kept on until a position was reached when the immediate answering of his one whistle put him "in extremis." The opportunity for prudence was then passed; he indicated that he would hold his course and speed; the Governor reversed to comply if possible with his signal, and then he reversed and the two ships came together.

C. H. Williamson Co.

C. H. Williamson, manager of the San Francisco office of Frank B. Hall & Co., has organized the firm of C. H. Williamson Co., Inc., which has taken over the Hall representation on the Pacific Coast and which will be represented in New York and London by the Hall company. Mr. Williamson is president; Harlow Hewett, who has been associated with Mr. Williamson in the Hall agency, is vice-president, in direct charge of the fire insurance department; J. W. Croseley, who was with the Canadian Bank of Commerce for several years prior to joining the Williamson staff in March, is secretary-treasurer. T. P. Kehoe is in charge of the marine department.

Organization of C. H. Williamson Co. and the assumption of the Hall representation is from August 1. Quarters will be maintained at 322 California street.

FULL SPEED AHEAD

Steamship Operations

China Mail vs. U. S.

After more than a year of uncertain maneuvering, issue at length has been joined between the China Mail Steamship Company and the government. The source of the disagreement and the legal action consequently impending is to be found in Section 38 of the Merchant Marine Act, which prohibits any corporation or partnership engaging in United States coastwise trade unless a minimum of 75 per cent of its stock is owned by American citizens. When this section of the Merchant Marine Act was brought to public attention more than a year ago there was general recognition of the fact that the China Mail necessarily would be involved, because the company admittedly could not fulfill the conditions laid down. For several months nothing whatever was done by the Shipping Board to shut the China Mail out of the San Francisco-Honolulu trade; in fact, a contrary course was pursued, and the company was permitted to carry passengers on the British steamship Nile by permission of the board. In March, however, all privileges were withdrawn from the Nile and the Japanese-registry vessels of the Toyo Kisen Kaisha, and in addition the board denied to the China Mail the right to engage in the San Francisco-Honolulu trade with the American-flag China and Nanking, and at the same time stopover privileges were refused, so that a through passenger on a China Mail or T. K. K. vessel could not stop in Honolulu and continue his voyage to or from the States in another liner of either company.

Fine of \$5000

In this manner the stage has been set for the present act. Determined to bring the situation to a head, and holding to the belief that it would not be interfered with, the China Mail dispatched twenty-five cabin passengers to Honolulu by the American-built, American-registered steamship Nanking, formerly the Congress. At Honolulu a fine of \$5000, at the fixed rate of \$200 a passenger, was imposed. The issue having been joined as regards the Nanking, the China Mail instructed

its Honolulu agency to accept one passenger for transportation by the China, due in San Francisco early in September, so as to make the case complete.

In some quarters, among which, according to report, were government agencies, the opinion had been held and expressed that the inhibitions of Section 38 were intended to apply only to freight and not to passenger business. Such an opinion certainly is buttressed by Section 27 of the act, which specifically applies to the transportation of "merchandise" between points embraced within the coastwise laws. On the other hand, much could be cited to prove that the intent of Congress always has been to close the passenger trade also to foreign vessels and, under the Merchant Marine Act, to certain American shipping as well.

American for 23 Years

But the most perplexing phase of the affair is this: newspaper dispatches from Washington say that Attorney General Dougherty ruled that the China was prohibited from engaging in coastwise business because owned by a corporation in which American citizens hold less than 75 per cent of the stock (which is admittedly true) and also because she was foreign-built. That she was constructed abroad also is admittedly true, but the question arises as to whether she was built in a foreign yard under the meaning of the Merchant Marine Act. In view of the 75 per cent clause, the foreign build of the China probably is quite academic; certainly it is unless and until the question of ownership should be settled against the government, in which event the China's build might become of paramount importance; nevertheless, to those who know the China's story, the fact that her build is brought up at this late day comes as a distinct surprise. A bit of history will make this matter clear.

When the Republic of Hawaii and the United States concluded negotiations for annexation of the mid-Pacific archipelago in 1898, Hawaiian vessels naturally were admitted to complete American registry, just as citizens of the little republic were granted American citizenship. Among

ships thus affected was the China. She was built at Glasgow in 1889 and in ordinary circumstances would have found admission to American registry about as difficult as going through the eye of a needle; but the circumstances, as stated, were extraordinary. (And some of the incidents relating to her transfer from British to Hawaiian registry and thence to American, which occasionally form a topic of discussion on the Honolulu waterfront, are not without interest.) Having thus gained American registry the China was placed on a basis of complete equality with all other United States vessels and was operated in conjunction with the Siberia, Korea, Mongolia and Manchuria, all American-built, in the service of the Pacific Mail until that company withdrew from the Oriental trade in 1915. She was bought by the newly-organized China Mail; for a time was the only American-flag vessel in the trans-Pacific trade, and has continued in the same service since.

Our Registry Laws

It is, of course, well known that practically the only vessels that flew the American flag prior to 1912 were built in yards of the United States. The exceptions almost could have been counted on one's fingers. There were two foreign-built vessels of the American Line, admitted by special act of Congress; prizes of war and vessels wrecked in American waters and repaired under prescribed conditions, in addition to former Hawaiian ships. All this shipping was on a basis of complete equality; American registry having been granted, the place where a vessel was built never was called into question.

In 1912 the Panama Canal Act admitted certain foreign vessels; the Ship Registry Act of 1914 let in others; but shipping brought in under these laws was forbidden to engage in coastwise trade, and it would have been shut out today had not Section 22 of the Merchant Marine Act provided that "all foreign-built vessels admitted to American registry, owned on February 1, 1920, by persons citizens of the United States . . . may engage in the coastwise trade so long as they continue in such ownership, subject to the rules and regulations of such trade."

Apparently, the attorney general's opinion places the China in the same category as other foreign-built vessels. But should she be so placed? Has Congress the power, or at least did it have the intent, to overturn the status created by the annexation of Hawaii, a status enjoyed by the China for twenty-three years, during which she regularly engaged in the San Francisco-Honolulu trade? Is not Section 22 purely permissive; that is, does it not clear the way for foreign-built vessels acquired during the war to enjoy all rights of home-built vessels, without prejudicing other rights gained prior to the passage of the act? To the layman these questions could be answered in the affirmative only.

Of course, as was stated above, this question, in the absence of a victory for the China Mail in regard to Section 38, must be considered as academic; nevertheless, it is full of interest and may become quite important. American registry of foreign-built vessels acquired during the war is something that may arise to vex the courts. For example, Section 22 of the Merchant Marine Act, in addition to admitting to American registry foreign-built vessels owned by American citizens on February 1, 1920, also covers "all foreign-built vessels owned by the United States at the time of the enactment of this act." So far, so good. But how about such vessels as Oriental, Mandarin, Cathay, Celestial, ordered of the Kiangnan yard, Shanghai, years ago but delivered after June, 1920? How about Japanese-built vessels completed late last year? Is a vessel "owned" when she is not even in existence? Is a contract for the construction of a vessel equivalent to ownership at the time of the passage of the Merchant Marine Act? Any person who contemplates the purchase of recently-delivered foreign-built vessels would do well to go rather deeply into these questions, for the ways of the United States government in enforcing registry and coastwise laws are exceedingly dark and devious. A few years ago, to make that point clear, the United States Navy owned an old collier called the *Justin*. When she was sold in 1915 she could not engage in coastwise trade because she was British-built. That foreign vessels could not and cannot now engage in the coastwise trade was notorious; yet in spite of the law the Navy Department formerly transported supplies to Mare Island, Bremerton and Pearl Harbor in foreign-built and foreign-flag bottoms.

Finally, in the case of the China, we discover a government agency, the Shipping Board, owning competing steamers and at the same time having power to grant or withhold suspensions of the coastwise laws so far as passenger service is concerned. To the layman that appears peculiar. The China Mail may be wrong in both the letter and spirit of the Merchant Marine Act, but the question may be asked whether it has had a hearing before an unbiased tribunal. What would the railroads of the United States say if the Interstate Commerce Commission owned a competing line?

Notice to Mariners

In all suits for mariners' wages, the libellant may proceed against the ship, freight, and master, or against the ship and freight, or against the owner or the master alone in personam.—Rules of Practice for the Courts of the United States in Admiralty and Maritime Jurisdiction, on the Instance Side of the Court, in Pursuance of the Act of the 23rd of August, 1842, chapter 188, quoted in Hughes on Admiralty.

Although persons versed in admiralty law doubtless have been well aware of the fact that proceedings could be instituted against a master for unpaid wages of a crew, the average layman, afloat and ashore, certainly will open his eyes at hearing that an action actually has been brought against a master for no less an amount than \$9000, with prospects, as this is written, that other members may join in, increasing the total to \$19,000.

Captain Tory Hedmark, former master of the wooden steamship *Agron*, is the victim of this rule. Eight seamen have brought the action in the United States District Court, Seattle. To make the captain's situation more unfortunate, "he is in the position," says the *Seattle Times*, "of not being able to collect his own wages." The *Times* goes on:

"The rule of admiralty law under which the suit was filed in the Federal Court is so ancient that its origin is lost in the mists of antiquity. The case filed in the Seattle court is the third of the kind in the history of the United States and the first filed in more than fifty years. The first two cases were obscure suits in the courts of Massachusetts. They were tried in the fore part of the last century. . . . When the rule had its inception, ships were so small that on a long voyage the wages of the crew might easily ex-

ceed the total value of the vessel."

A condensed history of the *Agron* case follows: She was purchased of the Shipping Board by the National Oil Transport Company of New York early in 1920. Capt. Hedmark was engaged by oral contract at the Shipping Board office and signed a crew for a twelve-month voyage to Sydney and elsewhere. On the same day, June 7, 1920, the vessel was documented at Seattle as of Shipping Board ownership.

From Seattle she proceeded to Sydney; thence to Newcastle, and thence with coal to Antofagasta and Iquique. Upon arriving on the West Coast in October, Captain Hedmark was directed to sell or charter the vessel; he was unable to do either, and in December was ordered to Galveston. At the Panama Canal he found himself without coal or supplies or funds with which to pay wages and tolls. He cabled home, but without relief, for both the National Oil Transport Company and the Shipping Board disclaimed ownership.

The shipping commissioner at Balboa took off the crew and advised the men to libel. This they did, with the result that the vessel, which cost \$750,000, was sold for \$16,000, less than half the crew's claim. Captain Hedmark, being master, had no rights corresponding to those of the men and accordingly received none of the proceeds of the sale. He contends that the Shipping Board actually was owner, despite the sale contract to the oil company.

That Captain Hedmark's assertion is not without foundation is borne out by the circumstances of documentation of the vessel and his own employment. The Shipping Board, moreover, although it permitted the *Agron* to be sold, as it has done recently in the case of the *Victor S. Fox* sailing vessels, yet in other instances, such as that of the United States Transport Company, has been quick to assert its claim and to seize vessels and to collect freight money, despite the fact that some shippers had prepaid charges. In short, the board evidently has assumed the position that a vessel belongs to the government when seizure is worth while, but that it belongs to the purchaser when nothing is to be gained by returning the craft to the board's possession.

Panama and the Japanese

Under the title of "Japanese Shipping and the Panama Canal" the Panama Canal Record publishes the first of a series of articles on trade through the canal under different

national flags during the fiscal year 1921. The article follows:

During the fiscal year ending June 30, 1921, 136 Japanese vessels passed through the Panama Canal carrying 767,608 tons of cargo. Their aggregate net tonnage under the Panama Canal rules was 613,245. One Japanese vessel passed through the canal four times during the year, 11 three times, 25 twice, and 49 once only. The following table shows the number of vessels under the Japanese flag which have passed through the canal in either direction during each of the last seven fiscal years, or since the canal was first opened to traffic on August 15, 1914:

Year	Atlantic Pacific		Total
	Pacific	Atlantic	
1915	4	2	6
1916	19	5	24
1917	54	18	72
1918	33	20	53
1919	47	40	87
1920	84	34	118
1921	86	50	136
Total.....	327	169	496

It is remarkable that in each of the years covered by the table more Japanese vessels passed through the canal from Atlantic to Pacific than in the opposite direction. For the entire seven-year period the proportion is nearly two to one. A similar preponderance of vessels in one direction has been noted in studying other features of canal traffic. It is apparently due to the fact that cargo steamers in the trade with the Orient commonly find it more profitable to move from port to port around the world, going out via Suez and returning via Panama, or vice versa, than to turn back over the same route followed in the outward voyage.

ports of the United States and the Far East, carrying general cargo. Five more loaded sugar and general cargo in Cuba for the Far East, and one discharged a cargo of rice in Cuba which was loaded in Saigon.

Ten Japanese vessels carried coal cargoes from Chesapeake Bay to the west coast of South America, and returned with nitrate for the United States or Europe. Five additional vessels, which had not passed through the canal going south, came north with nitrate cargoes from Chile.

Of the voyages described as miscellaneous, two were from Buenos Aires to Kobe, one from Hamburg to Kobe, one from Nuevitas to San Francisco, one from Tampico to Los Angeles, one from Portland to Alexandria, one from Kobe to Petrograd, and one from Vaparaíso to Tampico.

Only two of the 136 Japanese vessels using the canal passed through in ballast. One of these was bound from New Orleans to the Orient via San Francisco, and presumably picked up a cargo at the latter port. The other was bound from Valparaíso to Tampico and returned seventeen days later with an oil cargo from Tampico for Los Angeles.

The principal Japanese steamship companies passing vessels through the canal in 1921 were: Osaka Shosen Kabushiki Kaisha with 38 vessels; Nippon Yusen Kakushiki Kaisha with 26 vessels; Kokusai Kisen Kabushiki Kaisha with 25 vessels; Toyo Kisen Kabushiki Kaisha with 10 vessels; and Mitsui Bussan Kaisha with 7 vessels. The remaining 30 vessels in the list of 136 were distributed among 13 other owners.

A-H. to Europe

Williams, Dimond & Company, operators of the Shipping Board European-Pacific Line and Pacific Coast

and that the Shipping Board vessels with which Williams, Dimond & Company have maintained a service will be turned back to the government. Ports of call will be Liverpool, London, Hamburg and Antwerp, and Glasgow, Rotterdam, Havre and such others as may offer sufficient business. The first sailing from the Pacific Coast will be that of the Alaskan, October loading, and fortnightly sailings will be maintained thereafter.

Within the last few months competition on the Pacific-Europe route has become quite vigorous, and to the number of strong foreign lines engaged in the trade the Compagnie Generale Transatlantique recently was added.

Announcement also has been made by Williams, Dimond & Company of a new American-Hawaiian service from Philadelphia to the Pacific Coast, the first sailing to be that of the Floridian, scheduled for September 10, and other vessels to follow at intervals of two weeks. Bi-weekly sailings will be maintained from Boston and the New York-Pacific service will be increased from one vessel every ten days to one every week. The schedule will alternate New York sailings between Boston and Philadelphia, which means that all westbound steamers will call at New York and at one other port, either Boston or Philadelphia.

The American-Hawaiian has absorbed the Coastwise Transportation Company and now has twenty-eight ocean-going vessels. Ninety-eight per cent of the Coastwise stock was held by American-Hawaiian stockholders.

Labor on the Pacific

The Pacific American Steamship Association and the Shipowners' Association of the Pacific Coast have opened an employment office in San Pedro, in charge of Captain J. J. Meany, former inspector of hulls, San Francisco, at which all men for positions aloft and ashore will be recruited, stevedores, of course, being included. The San Francisco agency has been moved from 41 Drumm street to 84 Embarcadero, where the headquarters of the Waterfront Employers' Association also is situated.

Efforts of the associations to bring about a complete open shop on the Pacific are being centered on Portland longshore work, the marine strike being practically a thing of the past.

Wages of longshoremen and warehousemen of Seattle were reduced by agreement August 1, the average

Japanese Vessels Using the Panama Canal During the Fiscal Year 1921
Segregation by Trade Routes

Trade Routes	Vessels	Tons cargo
Atlantic and Gulf ports of United States to Far East.....	63	337,785
Far East to Atlantic and Gulf ports of United States.....	31	165,105
United States to west coast of South America	10	63,167
West coast of South America to U. S. and Europe	15	99,414
Cuba to Far East.....	5	35,135
Far East to Cuba.....	1	7,612
Atlantic and Gulf ports of U. S. to Australasia	3	20,063
Miscellaneous voyages, Atlantic to Pacific	5	23,840
Miscellaneous voyages, Pacific to Atlantic	3	15,487
Totals	136	767,608

(One vessel in ballast included in first and last classes.)

The great majority of Japanese vessels using the Panama Canal in 1921 (94 out of 136) were in the trade between Atlantic and Gulf

agents of the United American Lines (American-Hawaiian Steamship Company), announce that beginning with October sailings the American-Hawaiian will open a Pacific Coast-European service with its own steamships

cut being 10 per cent, from 90 cents an hour, \$1.35 for overtime, to 80 cents and \$1.20 for longshoremen, and from 80 cents and \$1.20 for warehousemen to 70 cents and \$1.05. The new agreement expires April 1.

Furness-Withy Coming

Announcement is made of the addition of another important shipping company to the Pacific Coast-European service. Furness, Withy & Company will place four steamships in the service, the first of which, the 9500-ton Mongolian Prince, will load in late September, the others following at intervals of one month. The Cordoba, one of the four, has refrigerator space for 4500 tons of cargo and will be able therefore to take large shipments of fruits. Intimations were given that the company's intention was to build up a large refrigerator service.

Competition in the Pacific-European trade is becoming very keen, for Furness-Withy follows the French Line by a month in announcing its service, and the American-Hawaiian will supplant the European-Pacific Line of Williams, Dimond & Company, maintained with Shipping Board vessels. All these developments indicate clearly that shipping companies see in the Pacific-Europe trade a promising future.

Books for Ships

Announcement is made that the trustees of the Carnegie Foundation have taken up the needs of American sailors for reading on shipboard and have authorized a gift of \$5000 from the funds of the foundation to the Social Service Bureau of the Merchant Marine, an organization devoted to the welfare of American sailors, of which Mrs. Alice S. Howard of Cleveland and Boston is the head. The money is to be devoted to the administration of a project for supplying books to merchant ships through the American Merchant Marine Library Association, together with other funds to be raised by the association.

This association, recently organized under the laws of the State of New York, is to take over the work done during the war by the American Library Association in supplying libraries to merchant ships. The library chests employed in this work contain books worth nearly half a million dollars. These are distributed to the ships from leading American ports and renewed each voyage.

A meeting to complete the organization of the new association, held recently at the Seamen's Church In-

stitute, New York, resulted in the election of officers representing a wide range of interests in the welfare of seamen, the roster being as follows: Mrs. Alice S. Howard, president; Winthrop L. Marvin, first vice-president; Captain F. A. Gainard, second vice-president; C. C. Smith, secretary-treasurer; and following executive committee: Mrs. Mabel Dean Bacon, Percy J. Pryor, Reverend Archibald R. Mansfield, D.D., Alfred Gilbert Smith, Franklin F. Hopper, Frank C. Munson and Bert L. Todd.

Shipping Briefs

In order to satisfy both Portland and Seattle, each of which objected to being made the second port of call, vessels of the North Atlantic & Western hereafter will give priority to the two ports alternately, one vessel going up the Columbia before proceeding to Puget Sound and the next going to Puget Sound first.

The San Francisco-Los Angeles service of the Los Angeles Steamship Company was first inaugurated in August, when the Harvard made her maiden voyage since her reconditioning.

The Honolulu agency of Hind, Rolph & Company, San Francisco, has been closed and the company's business in Hawaii turned over to the Henry Waterhouse Trust Company. John K. Clarke, manager of the Hind-Rolph branch in Honolulu, has become secretary and director of the Waterhouse company.

By mutual agreement between the waterfront employers and their employes in Puget Sound ports, the wages of longshoremen and warehouse workers were reduced an average of 10 per cent August 1. The agreement, which runs to April 1, was drawn up by committees representing the employers and the employes. This is the first time in the history of the Sound ports that wages of waterfront labor have been reduced without a fight. The old scale for longshore work was 90 cents an hour for straight time and \$1.35 an hour for overtime. Under the new scale, the longshoremen will receive 80 cents for straight time and \$1.20 an hour for overtime. Working conditions and rules remain unchanged.

An additional vessel, the Glenora, has been placed in the intercoastal

trade by the Atlantic-Gulf & Pacific, which now has seven steamships in that service. She sailed from Philadelphia for Mobile and the Pacific Coast in August.

The Northwest Shipping Company has been appointed Portland agent of the Latin-American Line, which was recently established by A. O. Lindvig. Lindvig steamships were engaged in the West Coast trade during the war, but were withdrawn in 1920.

The Canadian Pacific Ocean Services has bought the 19,300-ton Tirpitz, which will be renamed Empress of China and placed in the Pacific trade. The Prinz Friedrich Wilhelm was to be renamed Empress of China but she will remain on the Atlantic for a few months in the Cunard service, taking the place of the damaged Mauretania. The Tirpitz sale was made by Lord Inchcape.

G. S. Coppell & Brother, Mazatlan, have announced a new steamship service between San Francisco and the West Coast of Mexico. Six new steel steamers of 1500 tons deadweight, owned by the Clan Line, will be used. The Coppell firm will act as agent in Mexico.

The Compania Mexicana de Navegacion (Mexican Navigation Company) announces that the Mexican steamship Mexico will be operated between San Francisco and Mazatlan, Guaymas, San Blas (if inducements offer) and Manzanillo, and cargo offering, Acapulco and Salina Cruz. Arrangements are being made to extend the service to Central America and to employ one more steamer, sailings being monthly. The Anglo-Southern Company, Balfour building, San Francisco, is agent.

The Inter-Island Steam Navigation Company of Honolulu has purchased the holdings of the Demosthenes Lycourge estate in the Volcano House, Kilauea, Hawaii. In addition to the hotel property, about \$51,000 in cash, accumulated for new buildings, was involved. New officials of the hotel company are: J. M. Dowsett, president; J. W. Waldron, vice-president; W. A. White, treasurer; O. C. Scott, secretary, and G. P. Wilcox, auditor.

In May, 1920, American vessels were carrying practically half of the total foreign trade tonnage of the

United States. In the subsequent twelve months about 3,000,000 gross tons of vessels were added to the American sea-going tonnage, substantially a gain of about 30 per cent. Despite this, however, the share of the American merchant marine in its own carrying trade has declined sharply until now only a shade more than a third of the total exports and imports move in American ships. Slightly more than 50 per cent of the total value of American sea-borne imports were American carried in May, 1920, but in May of this year the proportion had declined to 35.6 per cent. In the same period the proportion of imports in United States vessels dropped from 44.1 per cent to 32.8 per cent, or less than one-third of the total. During the year the share of the total trade moving in American bottoms decreased from 46.4 to 33.7 per cent.

Announcement has been made in San Francisco of the incorporation of the Australian Dispatch Line as a subsidiary of J. J. Moore & Company. The line had been operated for many years as the charter business of the Moore company and the incorporation will entail no radical departures. J. B. Blair is president, V. H. Pinckney is vice-president, William Mainland secretary-treasurer, and Claude Daly general manager. Headquarters of the company are at 233 Pine street, San Francisco.

The Australian Commonwealth government line of steamers has announced an extension of the line's activities so as to provide for a service between England and Fiji, by way of the Panama Canal. The service will be maintained regularly, provided the cargo position offers sufficient inducement. Negotiations for the service, which have been in progress for some months, have been completed in London.

The Shipping Board 535 Empire State, the second of her class to be assigned to the Pacific Mail, arrived at San Francisco from Baltimore July 24 and sailed on her first trans-Pacific voyage July 30.

The management of the Suez Canal announces a reduction of 25 centimes in the canal tolls beginning October 1, after which the tolls will be 8 francs a net ton on ships with cargo and 5 francs 50 centimes on ships in ballast. During the six months ended June 30, 1921, the canal tolls on 1870 ships passing

through the canal were 70,150,000 francs; during the corresponding six months of 1920 tolls were 70,600,000 francs on 1868 ships; and during the corresponding six months of 1919 they were 61,760,000 francs on 1772 ships.

On her first voyage between Seattle and Honolulu, the Matson Navigation Company's new 14,000-ton freighter Manukai made the run in 7 days, 14 hours and 3 minutes, a record. She was built by the Moore Shipbuilding Company.

Fager & Wood have opened a custom house brokerage and freight forwarding business with offices in the I. W. Heilman building, Los Angeles. The senior partner was formerly with the foreign trade department of the American Express Company, Los Angeles and Seattle, and was export and import manager for the Union Pacific Railway at Seattle. Mr. Wood was Seattle manager of the Republic Forwarding Company and export manager of J. T. Steeb & Company, Tacoma.

On her maiden voyage across the Pacific, the U. S. S. B. Silver State, operated by the Pacific Steamship Company, made the voyage from Seattle to Yokohama in 10 days and 6 hours.

The Alaska Commercial Company announces that it has constructed at Unalaska tanks having a capacity of 20,000 barrels of fuel oil. Distillate also will be carried. The company has had a coaling station at Unalaska heretofore.

The commissioner of immigration reports that 15,543 alien seamen deserted in United States ports during the fiscal year ending June 30, 1921, as against 3388 in the preceding year.

On her August westbound voyage the White Star liner Olympic made the run from the Lizard to Ambrose Channel lightship, New York, 3055 miles, in 5 days, 18 hours and 18 minutes, at an average speed of more than 22 knots. Her best day's run was 559 miles.

Handling charges on cargo received from or delivered to trucks at Los Angeles, which were lifted by the Luckenbach Line July 1 and later by the Isthmian and Williams companies, are being reimposed, following protest of competitors, but the question cannot be regarded as definitely settled and a vigorous ef-

fort is being made in Los Angeles looking toward general abrogation.

The San Francisco Tugboat Company has been organized to take over the tugs of the Rolph Navigation & Coal Company and of Henry C. Peterson, Inc. Arnold Foster, assistant treasurer of the Bethlehem Shipbuilding Corporation, is president. Captain Clem Randall will be secretary and manager. The new company owns seven vessels, marked by black stacks bearing the letters S. F. in black on a white band.

The U. S. S. B. 535 Hawkeye State, operated by the Matson Navigation Company in the Baltimore-Pacific-Hawaii service, will make one voyage to the Orient for the Pacific Steamship Company while the Wenatchee is undergoing repairs.

In order to expedite the adjustment of freight claims and to further the relations of shippers and consignees, more than fifteen San Francisco steamship companies have formed a new organization to be known as the Pacific Steamship Claim Association. G. C. Keiber, freight claim agent of the Pacific Mail Company, has been named chairman, and H. M. Woodruff, claim agent of the Parr-McCormick Company, has been elected secretary.

Mississippi Service

Announcement is made by the Mississippi-Warrior Service of the War Department, Swayne & Hoyt, operators of the Pacific-Caribbean-Gulf Line, and the Luckenbach Steamship Company of eastbound through rates from ports of the Pacific Coast to St. Louis, East St. Louis, Illinois, and Memphis, effective August 4. Although Swayne & Hoyt had worked in conjunction with the War Department's barge service for a year, the new arrangement is a considerable advance in several particulars over the old, and the Luckenbach Line, moreover, has become a party.

All Pacific Coast ports except Astoria and San Diego are covered. Vancouver and Victoria take arbitraries of 12½ cents, and arbitraries probably will be imposed on Northern ports as compared with San Francisco rates. Class rates average about 25 per cent less than those of the railroads.

Luckenbach Expansion

In addition to establishing its own office in Portland, the Luckenbach Steamship Company also has opened an office in the L. C. Smith building, Seattle, under R. S. James as man-

ager. Mr. James was formerly with the Pacific Steamship Company. H. G. Tiesel has been appointed auditor and cashier of the Seattle office and H. E. Troyer contracting freight agent.

The Luckenbach Line has been assigned Pier 39, San Francisco, growth of business having necessitated more room than was given by Pier 41. Offices to house departments closely connected with the operation of vessels will be built at the wharves.

Not Always Friends

Conferences of the Far East, in common with those of the United States, are having their difficulties. Comes now the Osaka Shosen Kaisha with the threat that it will increase its service between Japan, Java and Calcutta in competition with the Calcutta Freight Conference if its request for admission to that organization is denied. Denied it apparently will be, for the N. Y. K., British India Steam Navigation and Indo-China manifest a desire to keep the trade to themselves. In so doing they have an effective weapon in the form of a 10 per cent deferred rebate, the like of which is not to be seen on this side of the water, not openly, at any rate, since Senator Jones got in his work last year. The O. S. K. cannot gain admission to the Calcutta conference even though it is a member of the Bombay organization, other adherents of which are the N. Y. K. and P. & O. But the fact that the O. S. K. and N. Y. K. are playmates in one pasture does not signify that they like each other when they climb the fence. The O. S. K. extended its Java-Calcutta service to a Japan-Java-Calcutta in February, 1920.

In Pacific Also

Reports from the Orient say that the eastbound trans-Pacific organization is near the rocks. Although the conference rate on general cargo was \$9, outside companies were bidding \$3 and \$4, which forced down the conference rate to \$6, and some conference members were suspected of secret rate-cutting. When that suspicion gets abroad, the end is in sight.

"Shagaisen" vessels, or those belonging to companies other than the subsidized lines of the O. S. K., N. Y. K. and T. K. K., engaged in ocean services, at the beginning of June numbered 160 of 726,435 tons, a decrease of 43 vessels of 149,000 tons since the first of April. Declines were registered as follows: European service, 3 vessels; Mediterranean, 10; South American, 2;

Australian, 3; Malaysia, 15; but the North Atlantic and the North Pacific increased by one each. Coasting and near-sea trades absorbed some of the withdrawn tonnage. During June, however, the following changes were made: decreases, North Atlantic, 6 vessels of 44,805 tons; North Pacific, 2 of 7665; East Coast of South America, 5 of 27,593; Australia, 4 of 14,393; increases, Europe, 7 of 50,142; West Coast of South America, 1 of 9422. At the end of June, total Japanese shipping, vessels of less than 1000 gross tons excluded, was 795 ships of 2,725,567 gross tons.

On June 15 tied-up tonnage in Japan ports aggregated 392 vessels of 218,196 tons, a decrease of 4 of 33,274 tons in the month. Of the idle vessels, 224 of 194,001 tons were steamers, 49 of which exceeded 1000 gross tons.

Business Improves

An increase in cargoes is observed in the Far East. The Pacific Mail liner Golden State sailed from Shanghai in July with more than 3000 bales of raw silk, valued at about \$3,000,000, which would have been a large shipment even in 1919, when not to have a silk shirt was to display one's poverty. Rice shipments from Korea and Formosa have been stimulated by the high prices of domestic grain; Dairen is dispatching much foodstuffs to Europe; a contract for the transportation of 130,000 tons of coal from Japan to India has been awarded to the Yamashita Kisen Kaisha; shipments of glassware, porcelain and cotton goods to South America are growing; a fair-sized tonnage of Kamchatka herring will be sent to Europe; and, probably most important, Javan and Formosan sugars are ready for transportation to Europe and Japan. Nevertheless, shipowners are not convinced that the improvement is permanent and they are loath to return tied-up vessels to service.

Passenger business shows a decline, according to figures of N. Y. K. business for May, during which the company transported 19,459 persons as against 22,227 in May, 1920. Travel to North America, however, increased 65 per cent.

The Yamashita Kisen Kaisha has opened a service between Kobe, Saigon and Bangkok, and is reported to be considering a Yokohama-Tsingtau line.

Old Vessels in Demand

The Japan Advertiser notes an increased demand for old vessels and explains it thus:

In the case of a ship of 2000 tons, built in 1910, the price may be estimated at yen 50 per ton, the total price being yen 100,000. Registration and other fees amount to yen 5000, so that the aggregate cost is yen 105,000. The cost of the ship may be written off to the extent of yen 7500 a year, the interest rate being calculated on a compound 8 per cent. Monthly wages and the cost of food amount to yen 2300, repairs to yen 5000, insurance to yen 6000, articles for consumption to yen 3600 and taxes and miscellaneous expenses to yen 2400. Assuming that yen 105,000 paid for the ship and fees has been borrowed, yen 8400 must be paid as interest at the rate of 8 per cent per annum.

When calculations are made in this way the annual expenses amount to yen 60,500 or yen 5260 a month, the year being taken as 11 months and a half. Daily expenses work out at yen 175.36.

If this steamer is used between Muroran and Yokohama for the shipment of coal, the expenses for one voyage will amount to yen 2700. Assuming that the coal freight rate is yen 1.80 per ton, as compared with the ruling quotation of between yen 1.90 and yen 2, the proceeds for one voyage will amount to yen 3150. Thus the net gain amounts to yen 450 for one voyage between Muroran and Yokohama or about yen 1200 per month.

This is why old ships have begun to attract attention.

Ex-German to White Star

Homeric will be the new name of the 35,000-ton German-built liner Columbus, recently purchased from the Reparations Commission for the White Star Line.

In the race for building big liners that was in progress when the war broke out, the White Star had laid down at Belfast the keel of a 35,000-ton ship, which was to be named Homeric. At the same time the Germans had under construction at Danzig a 35,000-ton ship, which they named Columbus. Pressure of war construction made it advisable to halt work on the Homeric, and the materials intended for her hull were used in the building of other vessels. The Columbus was farther advanced, and now, having been completed to order of the Reparations Commission, becomes the Homeric.

The International Mercantile Marine Company states that definite plans for the ship's route are now under consideration. It is probable that she will make a few voyages between Liverpool and New York this fall, but it is planned to put her on the run to Southampton later with the Olympic.

Shipbuilding

Pacific Building

On August 1, according to returns compiled by Pacific Marine Review, there were 17 steel ocean-going steamships of an aggregate deadweight tonnage of 200,290 under construction in yards of the Pacific Coast of the United States, as compared with 23 of 259,890 tons July 1. Deliveries during July were of 6 vessels of 59,600 tons, and no new contracts for ocean-going vessels have been let. Of the July deliveries, 1 vessel of 11,000 tons was a freighter for the Shipping Board; 4 of 40,200 tons were Shipping Board tankers, and 1 of 8400 tons was a tanker for foreign private account. No deliveries were made of tankers for private American owners. Only one tanker for the Shipping Board remains to be completed.

August promised to witness the delivery of a greater volume of tonnage than did July, 6 vessels of 62,540 tons being scheduled for completion.

There has been no change in the status of vessels under construction in Canadian yards.

The following table shows work under way August 1:

American Yards	No. Vessels	Agg'te D.W.
Freighters, USSB....	3	33,000
Tankers, USSB.....	1	10,000
Tankers, private....	7	83,690
Freighters, private	2	40,000
Tankers, foreign....	4	33,600
Totals.....	17	200,290
Canadian Yards		
Freighters, gov't....	4	33,480
Freighters, private	1	600
Totals.....	5	34,080

July Deliveries

The Bureau of Navigation, Department of Commerce, reports 106 sailing, steam, gas and unrigged vessels of 84,918 gross tons built in the United States and officially numbered during July. Three vessels of 27,994 gross tons were built for the Shipping Board, and one of 5718 gross tons was for foreign owners. During the same month 9 small vessels totaling 346 gross tons were transferred to foreigners with the approval of the board. From other sources than construction, two vessels of 30 gross tons and one of 7030 gross tons were admitted to American registry.

Fewer Employees

The principal shipbuilding companies on the Atlantic and Gulf employed approximately 37,000 less shipyard workers on July 1 than they did one year previous. The following table on shipyard employment conditions has been prepared from working force reports received from the more important yards covering a territory extending from Maine down the Atlantic seaboard and along the Gulf of Mexico to Louisiana. The figures show the maximum totals of workmen in the employ of the various companies exclusive of supervisory forces, office help and employees engaged in erecting or installing work at outside points:

Date	Number of Shipyards Reporting	Number of Workmen Employed	Perctge. of Dec. since July 1, 1920
July 1, 1921	21	49,101	43.1
April 1, 1921	22	65,914	23.6
January 1, 1921	20	79,808	7.4
October 1, 1920	21	83,656	3.1
July 1, 1920	22	86,232	.....

New Work

Bids have been requested of American and British shipbuilders by the Western Union Telegraph Company for the construction of a cable vessel. She will be of steel, of the combined long poop and bridge and separate top-gallant forecastle type, with continuous upper and main decks and a lower deck tier of beams. She is to have an elliptical cruiser stern, with a clipper bow, and is to be schooner-rigged with two steel masts, having four 10-ton booms on the foremast and two 5-ton booms on the mainmast. Her dimensions will be: length, 340 feet 6 inches; breadth, 42 feet 6 inches; depth molded to upper deck, 25 feet. She will be propelled by four Diesel engines driving direct-current generators, and a direct-current motor on each propeller shaft.

Nine of the largest American shipyards submitted bids for the con-

struction of two 4300 deadweight ton freight and passenger steamers designed for service between New York and Venezuela for the Red D Line. It is reported that bids were received from the New York Shipbuilding Corporation, Newport News Shipbuilding & Drydock Company, William Cramp & Sons Ship & Engine Building Company, Bethlehem Shipbuilding Corporation (Sparrows Point), Merchant Shipbuilding Corporation, Federal Shipbuilding Corporation, Sun Shipbuilding Company, Bath Iron Works, and the Todd Shipbuilding Corporation (Tacoma). There is keen interest among the shipbuilders, as there have been no large contracts awarded within the past year for a passenger vessel. It will require from eleven to fourteen months to build the vessels.

As an indication of the importance

attached by manufacturers to the all-water route between the Great Lakes and New York, it is interesting to note that Henry Ford is considering the operation of a fleet of self-propelled freight barges between Detroit and the seaboard via the Erie Canal. It is reported that the barges, which will soon be constructed, will be designed to handle the entire Atlantic seaboard freight of the Ford company.

Plans of a combination vessel for the Inter-Island Steam Navigation Company of Honolulu will be completed about September 15 by Pillsbury & Curtis, San Francisco. There is a good prospect that bids will be called soon thereafter.

The Bethlehem Shipbuilding Corporation, San Francisco, has received a contract for the construction of two steel ferries for the Six Minute Ferry Company, details of which will be found in yard notes.

Pacific Yard News

Bethlehem

Bethlehem, San Francisco, has been awarded a contract for two steel ferryboats for the Six Minute Ferry Company, San Francisco Bay, with prospects that a third will be ordered later. The vessels will be 230 feet over-all, 63 feet 6 inches beam over guards, 42 molded; depth

of 19 feet 6 inches; and they will be powered with three watertube boilers and triple-expansion engines developing 1400 horsepower. They will have propellers at both ends. Dates of keel-layings have not yet been set.

The Potrero plant has been awarded a contract for repairing the U. S.

S. B. 535 Golden State at a cost of \$91,600, the work consisting of rearrangement of crew's quarters, installation of a new ventilating system and making other changes.

The Alameda Works launched the 15,000-ton tanker F. H. Hillman for the Standard Oil of California on July 28.

Cholberg

The Dominion government will complete three barkentines under construction at the Cholberg yard, Vancouver, for the Victoria Shipowners, Ltd. A contract has been awarded to the Victoria Machinery Depot Company for completion of the first of these vessels, the S. F. Tolmie, which was reported completed but which needs rigging, finishing, cleaning and painting. Tenders will be invited for the three now under construction by Cholberg.

Los Angeles

Los Angeles has delivered the 11,000-ton freighter West Faralon, the second of five building for the Shipping Board, and has launched the West Prospect, the fourth vessel. The West Chopaka, the last of the five, is scheduled to be launched early in September.

Moore

Within a few weeks after the Bethlehem Shipbuilding Corporation, San Francisco, delivered its last Shipping Board vessels, the Moore Shipbuilding Company, Oakland, also completed its program, the 10,000-ton tanker Tustem having been delivered July 29 and the sister Lubrico August 10. With the completion of these vessels the Moore yard was left with the 4750-ton motorship H. T. Harper for the Standard Oil of California, delivery scheduled for September 1; the 16,340-ton tanker Tamiahus for the Southern Pacific Atlantic Line, scheduled for August 20, and the 10,100-ton tanker Birkhead for Vacuum Oil, scheduled for September 5.

The Lubrico was the last tanker under construction for the Shipping Board on the Pacific Coast.

The Birkhead is a sister of the Vacuum and Gargoyle, both of which were added to the Vacuum fleet last year. The fleet now consists of five 10,000-ton steamers, one of 9000 tons, a motorship of 5090 and another of 1750, besides a steam lighter.

Navy Yard, Mare Island

At 12:45 o'clock, August 10, the battleship California was commissioned at the Mare Island Navy Yard, which built her. Captain H. J. Ziegmeier assumed command, with Captain W. A. Smead as executive officer. Pursuant to the policy of

the Navy Department, to man capital vessels with natives of the states for which named, the California has an all-California crew, and in addition, of course, was built in that state. She was taken to the Hunters Point graving dock of the Bethlehem Shipbuilding Corporation for installation of propellers and later in the year will make her first cruise to Hawaii. She will then become the flagship of the Pacific fleet.

The Navy Yard has been instructed by Washington to discontinue construction of the dreadnought Montana during the current fiscal year. This will curtail the yard's work greatly, inasmuch as destroyers are the only other vessels building.

Pearl Harbor

A marine railway of 3000-ton capacity and costing \$230,000 will be constructed at the Pearl Harbor naval station, Hawaii. The Hawaiian Construction Company has the contract.

Prince Rupert

The name of the second 8400-ton steamship building at the Prince Rupert yard for the Canadian Government Merchant Marine has been changed from Canadian Thrasher to Canadian English. She was due to be launched in August. The first, Canadian Scottish, was to be delivered about the end of August.

Southwestern

The 8400-ton tanker Silvanus, built by the Southwestern Shipbuilding Company for Dutch Shell, was delivered August 10, and the sister Semiramis was scheduled for delivery August 31. She was launched Au-

gust 6. Besides these vessels one other, La Purissima, a 7500-ton tanker for Union Oil, was under construction. She is scheduled for September delivery.

Todd

The Todd Drydocks, Seattle, have been awarded a contract for alterations and improvements of the U. S. S. B. 535 Wenatchee on a bid of \$149,600, insurance included; time limit, 45 days. Other bids, submitted by California yards, were higher, and some were materially higher when the bidder agreed to assume insurance. Inasmuch as the Wenatchee was at Seattle the Todd yard's position was impregnable.

Union Construction

Union Construction launched the 8400-ton tanker Amalthus for Anglo-Saxon Petroleum August 11 and delivered her sister, Ampullaria, a few days later. These were the last merchant vessels under construction at the yard.

Advices from Washington state that three of the Coast Guard vessels building by Union Construction, the cutters Mojave and Haida and tug Shawnee, will be assigned to the Pacific Coast and Alaska and that the other two, the cutters Modoc and Tampa, probably will go to the Atlantic. The Tampa is named for a Coast Guard cutter lost in the war. She had her trial August 10. The second sister, Haida, will be delivered about September 3; and the third and fourth, Mojave and Modoc, will be launched about the same time, to be followed a few days later by the Shawnee.

On Atlantic and Gulf

Bath

The Bath Iron Works delivered the Thomas P. Beal, a 9600-ton freighter, to Crowell & Thurlow in August. She was the last vessel building at the yard.

Bethlehem

The Harlan plant, Bethlehem, has received a contract to build a 2600 deadweight ton tanker for the Atlantic Refining Company. The vessel will be used to serve ports in which the water is too shallow for large tankers. She will be 266 feet between perpendiculars, 39 broad, and will have a loaded draft of 17 feet, a loaded speed of 8½ knts., and will be equipped with turbine engines developing 750 indicated horsepower. The boilers will be built by Babcock & Wilcox.

Sparrows Point launched the 20,-

000-ton combination ore and oil carrier G. Harrison Smith, built for the International Petroleum Company on July 12. Three sisters, all for the Ore Steamship Company (Bethlehem Steel Corporation), are under construction.

Crandall

The Crandall Engineering Company of Boston is the designer and constructor of a 1200-ton railway drydock being built for the Sydney Foundry & Machine Works, Sydney, Nova Scotia. Vessels displacing up to 1200 tons will be accommodated on this new dock, which measures 200 feet over the keel blocks; 50 feet wide, and gives 10 feet of water forward and 16 feet aft over the blocks. The construction will be completed and the dock in operation early in October.

Doullut & Williams

Six oil-carrying steel barges are under construction by Doullut & Williams, New Orleans, for their own account. Two were launched in July and four in August. The yard recently completed its Shipping Board work.

Federal

Two tankers, the Victrolite and the J. A. Moffett, Jr., have been delivered by the Federal Shipbuilding Company to the Standard Oil Company of New Jersey, the former having been turned over July 8 and the latter August 5. They are sisters of 15,000 tons deadweight. Three 9400-ton freighters for United States Steel Products remain under construction.

Foundation

The French High Commission is offering for sale the Foundation Company Shipyard No. 12, located at New Orleans, where several 6000-ton steel vessels of the LeParmentier type were built. The yard covers an area of 90 acres with a launching basin of 20 acres, the latter having a minimum depth of 25 feet. There are three ways.

Job

The shipyard established in Machias, Maine, in 1918 by the Job Shipyard Corporation has been abandoned by the owners, who have gone out of business, and the buildings, machinery and other property have been disposed of at auction. The mill building, 37 by 70 feet, two and one-half stories high, has been sold to the Machias Valley Co-Operative Association, and will be used as a blueberry cannery.

Johnson

Two steel barges and one steel tug were added to the Mexican oil fleet in the Tampico district by recent launchings at the Bayou St. John yard of the Johnson Iron Works, New Orleans. On June 23 the company launched for the New England Fuel Oil Corporation a steel oil barge 200 feet long, 42 feet wide and 8 feet 3 inches deep. This barge is equipped with a Bumbo-Buster pump connected with a 12-foot suction pipe, and is capable of loading 1300 barrels of oil an hour. On June 16 the Mex 42, a steel tug, was delivered to the Gulf Refining Company. She was designed for towing barges of the company in the Tampico district. Another barge, the Mex 43, was launched June 9, also for the account of the Gulf Refining Company.

McDougall-Duluth

Motorship No. 101, constructed by

the McDougall-Duluth Shipbuilding Company, Duluth, is reported to be the first motorship of a fleet of five cargo carriers to be operated on the Great Lakes and the New York barge canal. This craft recently visited the port of New York on her maiden voyage and attracted considerable attention. She is operated by the Interwaterways Line. She arrived with a cargo of 83,000 bushels of oats at a carrying cost of 60 percent below the rail rate, and did it in six days of actual running time. The motorship made the trip across the Great Lakes from Duluth to Buffalo, thence through the Erie barge canal to Troy, then down the Hudson to New York. She is 254 feet long with a 36-foot beam and a molded depth of 14 feet, and is by far the largest boat that has ever gone through the barge canal.

Merchant

The Merchant Shipbuilding Corporation has been awarded a contract for an all steel fire boat by the city of Philadelphia. The contract price is \$212,490, the lowest bid of those submitted. The Pensacola Company's \$212,500 came next. The boat is to be completed in seven months. It will be 120 feet 9 inches long overall, 28 feet beam, 12 feet 9 inches in depth, and will have a draft of 9 feet. It will be equipped with a vertical compound engine developing 500 indicated horsepower, steam for which will be supplied by two Babcock & Wilcox boilers equipped for oil burning.

Fire apparatus will consist of four turbine driven fire pumps, one main water tower 30 feet above the main deck, and two small towers 15 feet above the same deck. On top of each tower and atop the pilot house will be mounted a 3000 gallon monitor nozzle made to operate at a working pressure of 250 pounds. These four nozzles will be capable of throwing 12,000 gallons of water a minute. This is the first contract received by the company since the end of the war.

Merchant delivered the 10,000-ton tanker LaPlaya to the Union Oil Company in July and launched a sister ship, Robert E. Hopkins, for the Tidewater Oil August 6.

Morse

The Fort Morgan, a fruit ship damaged almost beyond recognition by a peculiar collision in which her superstructure was swept into a tangled mass of wreckage by the bowsprit of the schooner Nancy Hanks, has been repaired by the Morse Drydock & Repair Company.

The Fort Morgan was a sorry look-

ing vessel when she was towed to the Morse yard for repairs. Her officers' quarters were smashed, part of the rail gone, her smokestack and ventilators looking like accordions and lying in a wreck of tangled metal and splintered wood. In ten days from the time the work began the Fort Morgan steamed away, newly-painted and looking like a new ship. The officers' quarters had been rebuilt, the rail renewed, a new smokestack erected, eight ventilators repaired or renewed, and the entire vessel put in a seaworthy and shipshape condition.

Of the ten or more bids ranging from that of the Morse Company, \$8615 in ten days, to that of another company, \$14,850 in fourteen days, the average was far below what it would have been a year ago, when the cost would have been probably \$25,000.

Newport News

Two tankers under construction by the Newport News Shipbuilding & Drydock Company for the Standard Oil Company of New Jersey appear to be the largest merchant vessels of their class ever laid down. Each is of 20,300 tons deadweight, or 300 tons more than the large combination vessels of International Petroleum and Bethlehem Steel. The first of the two, the John D. Archibald, was scheduled for August launching and October delivery. The second, the William Rockefeller, probably will be launched in October and delivered in December.

New Jersey

The fire boat Rudolf Blankenburg, named for the late Mayor Blankenburg of Philadelphia, was launched at the yard of the New Jersey Drydock Company August 9. The vessel is 129 feet 9 inches in length, with a beam of 28 feet and a depth of 12 feet 9 inches. It has a displacement of 350 tons, draws 9 feet of water aft and 8 feet forward, and is fitted to burn fuel oil. The fuel-storage capacity is 40 tons.

New York

New York Shipbuilding Corporation launched the 9870-ton tanker Eurana, built for its own account, July 16, and the 12,550-ton tanker Levant Arrow, building for Standard Transport, July 25. The latter vessel is scheduled for fall delivery instead of winter, as formerly. The Shipping Board 535 Lone Star State is scheduled for fall delivery instead of summer.

Pensacola

The Pensacola Shipbuilding Company, Pensacola, Florida, was the

lowest of seventeen bidders for constructing a steel drillboat for the United States Engineers' office, 15 Whitehall street, New York, the boat to be 140 feet long and 50 feet beam. The equipment includes two water-tube boilers, fitted with oil burning system. The Pensacola bid was \$368,000, and the high bid was made by the Bath Iron Works at \$620,000.

Portsmouth

The submarine S-12 was launched at the Portsmouth Navy Yard August 4. The vessel, 235 feet long and of 600 tons displacement, is the last but one of the S class to be constructed by the navy. This makes the tenth submarine of the S-12 type to be built at the yard. Her keel was laid January 8, 1921.

Standard

The fireboat John Purroy Mitchell, built by the Standard Shipbuilding Corporation for the City of New York, was launched August 6. She is named for the former mayor of the city who was killed in an aviation accident during the war. The vessel is the ninth fireboat of the city and is the first to burn fuel oil.

Sun

The Sun yard, Chester, launched the 12,500-ton tanker Agwimex for the Atlantic, Gulf & West Indies August 6.

States Island

President Roosevelt was the name selected for the ferryboat under construction by the States Island Shipbuilding Company for the City of

New York, which was launched July 16. She will be used between St. George and the municipal pier at South Ferry.

Union

The tanker Gulf Prince, constructed by the Union Shipbuilding Company for the Gulf Refining Company, which was launched recently with her machinery completely installed, will soon be ready for delivery. She is the second tanker built by the Union Shipbuilding Company for the Gulf Refining Company, the first being the Gulf King. The vessel is 419 feet long, 66 feet 6 inches beam, and has a draft of 26 feet 9 inches. She is to carry 10,000 tons deadweight, representing 3,000,000 gallons of crude oil.

Virginia

The Virginia Bridge & Iron Company, Roanoke, Virginia, with branch plant at North Memphis, Tennessee, has acquired about ten acres on the Wolfe River, formerly occupied by the Anchor Saw Mills, for the production of all-steel barges. Preliminary work has been commenced; existing buildings will be remodeled and improved to accommodate the new industry and machinery installed at once. The steel to be used in construction of the barges will be fabricated at the North Memphis plant. Orders have been taken for the construction of four barges, 30 feet wide and 125 feet long, for oil service in the vicinity of New Orleans.

Pacific Coast Reports

United States

BETHLEHEM SHIPBUILDING CORPORATION, LTD. Potrero Works

Purchasing Agent: O. W. Street.
Submarines USN: S-31, hull 136; S-32, hull 137; S-33, hull 138; S-34, hull 139; S-35, hull 140; S-36, hull 141; S-37, hull 142; S-38, hull 143; S-39, hull 144; S-40, hull 145; launch Jan5/21; S-41, hull 146.

Alameda Works

Chilore, hull 5309, combination ore and coal carrier Ore Steamship Co; 571-6 LOA; 550-1 LBP; 72 molded beam; 44 molded depth; 32-4 loaded draft; 11½ loaded speed; 20,000 DWT; Curtis turbines with Falk reduction gears, 5000 SHP; 3 Scotch SE boilers, 17-6x12, each 4287 sq ft; oil burners.

Lebore, hull 5310, combination ore and coal carrier Ore Steamship Co; sister to above.

F. H. Hillman, hull 5311, tanker Stand Oil Co of Cal; 500 LBP; 68 beam; 25-11 loaded draft; 11 loaded speed; 15,000 DWT; rec engs, 4000

IHP; 3 Scotch marine boilers, 16x 12-9; keel Jan10/21; launch July 28/21.

H. M. Storey, hull 5312, tanker Stand Oil Co of Cal; sister to F. H. Hillman; keel Jan19/21.

W. S. Rheem, hull 5313, tanker Stand Oil Co of Cal; sister to F. H. Hillman; keel Mar1/21.

No name, hull 5314, ferryboat Six Minute Ferry Co; 230 LOA; 63-6 beam over guards, 42 molded; 19-6 molded depth; TE eng, 1400 IHP; propeller drive; 3 WT boilers.

No name, hull 5315, ferryboat Six Minute Ferry Co; sister to above.

HANLON DRYDOCK & SHIPBUILDING CO., OAKLAND

Purchasing Agent: R. Barker.
Dan F. Hanlon, hull 89, steam schr. D. J. Hanlon; 2500 DWT; 1400 IHP engines; 2 B&W boilers.

LOS ANGELES SHIPBUILDING & DRYDOCK CO., SAN PEDRO

West Farallon, hull 32, steel cargo USSB; 430 LBP; 54 beam; 28-2 loaded draft; 10½ loaded speed; 11,000 DWT; TE engs, 3500 IHP; 3 Scotch

single end, 15-9; keel Sept27/20; launch Apr19/21; deliver July21.

West Greylock, hull 33, steel cargo USSB; sister to above; keel Nov10/20; launch June/21; deliver Aug9/21 est.

West Prospect, hull 34, steel cargo USSB; sister to above; keel Dec31/20; launch July30/21; deliver Sept14/21, est.

West Chopaka, hull 35, steel cargo USSB; sister to above; keel Feb24/21; launch Sept6/21, est; deliver Nov25/21, est.

MOORE SHIPBUILDING COMPANY, OAKLAND

Purchasing Agent: W. E. Hostetter.

Tustum, hull 2863, tanker USSB; 425 LBP; 57 beam; 26 loaded draft; 10,000 DWT; rec eng; 3 Scotch boilers, 15-2x11; keel Nov24/20; launch June15/21; deliver July29/21.

Lubrico, hull 2864, tanker USSB; sister to above; keel Jan21/21; launch June15/21; deliver Aug/21.

H. T. Harper, hull 163, tanker Standard Oil Co of California; 330 LBP; 46 beam; 21-6 loaded draft; 4750 DWT; Skandia Diesel engs; keel Oct/20; launch June16/21; deliver Sept1/21, est.

Tamiahua, hull 165, tanker S. P. Atlantic S S Co; 520 LBP; 71 beam; 28 loaded draft; 16,340 DWT; rec engs; 3 Scotch boilers, 15-9x12; keel Feb28/21; launch July2/21; deliver Sept21, est.

Birkenhead, hull 166, tanker for Vacuum Oil Co; 425 LBP; 57 beam; 26-3 loaded draft; 10,100 DWT; rec engs; 3 Scotch marine boilers, 15-2x 12; keel Dec9/20; launch July9/21; deliver Sept5/21, est.

NAVY YARD, PUGET SOUND

Medusa, repair ship for government; 460 LBP; 70 beam; about 19 loaded draft; 17-5 loaded speed; turbine eng, 7000 IHP; 2 WT express type boilers; 10,000 tons disp; keel Jan2/20; launch and deliver dates not set.

Holland, submarine tender for government; 460 LBP; 61 beam; about 20 loaded draft; 16 K loaded speed; turbine eng, 7000 IHP; two WT express type boilers; 10,000 tons disp; keel April/21.

NAVY YARD, MARE ISLAND

California, battleship USN; 600 L BP; 97-3½ beam; 30-3 loaded draft; 21 loaded speed; 32,300 disp; turbo-electric engs, 26,800 SHP; 8 Bu's express boilers, 50,984 sq ft; keel Oct 25/16; launch Nov20/19; commissioned Aug10/21.

Montana, battleship USN; 660 LB P; 105 beam; 33 loaded draft; 23 loaded speed; 42,200 disp; turbo-electric engs, 60,000 SHP; 12 Bu's express boilers, 74,040 sq ft; keel Sept 1/20; work suspended.

Wasmuth, destroyer USN; 310 LB P; 30-11½ beam; 9-4 loaded draft; 35 loaded speed; 1215 disp; geared turbine eng, 26,000 SHP; 4 Normand boilers, 27,000 sq ft; keel Aug12/19; launch Sept15/20.

Trevel, destroyer USN; sister to above; keel Aug12/19; launch Sept 15/20.

Perry, destroyer USN; sister to above; keel Sept15/20.

Decatur, destroyer USN; sister to above; keel Sept15/20.

SOUTHWESTERN SHIPBUILDING CO., EAST SAN PEDRO

Purchasing Agent: J. J. Wilson. La Purissima, hull 23, Isherwood tanker Union Oil Co; 392 LBP; 51 beam; 23-11 loaded draft; 11½ loaded speed; 7500 DWT; TE engs, 2800 IHP; 3 Scotch boilers, 14x12; keel Dec22/20; launch Sept7/21, est; deliver Sept21, est.

Silvanus, hull 25, Isherwood tanker Nederlandsch-Indische Tankstoomboot Maatschappij; 412 LBP; 53 beam; 24-7 loaded draft; 11 loaded speed; 8400 DWT; TE engs, 2700 IHP; 3 Scotch boilers, 15-6 x 11-7; keel Oct20/20; launch June 30/21; deliver Aug10/21.

Semiramis, hull 26, Isherwood tanker Nederlandsch-Indische Tankstoomboot Maatschappij; same as above; keel Nov 5/20; launch Aug6/21; deliver Aug31/21, est.

TODD DRYDOCK & CONSTRUCTION CORP., TACOMA

Purchasing Agent: C. L. Bankson. Omaha, hull 100, scout cruiser USN; 555-6 LOA; 550 LBP; extreme beam 55-4; molded beam 54-9; depth molded 26; mean loaded draft 13-6; disp 7100 tons; Westinghouse Parsons turbines and reduction gear, 105,000 IHP; designated asset 34; 12 Yarrows WT boilers; keel Dec6/18; launch Dec14/20.

Milwaukee, hull 106, scout cruiser USN; sister to above; keel Dec13/18; launch Mar24/21.

Cincinnati, hull 107, scout cruiser USN; sister to above; keel May15/20; launch May23/21.

UNION CONSTRUCTION CO., OAKLAND

Purchasing Agent: A. J. Farnsworth.

Tampa, hull 16, cutter USCG; 240 LOA; 39 beam; 14 loaded draft; 16 loaded speed; 1600 DWT; turbo-electric engs, 2600 IHP; 2 WT boilers; keel Sept27/20; launch April6/21; deliver Aug1/21.

Haida, hull 17, cutter for USCG; same as the above; keel Sept27/20; launch April9/21; deliver Sept3/21, est.

Mojave, hull 18, cutter USCG; same as the above; keel April6/21; launch Sept1/21, est.

Modoc, hull 19, cutter USCG; same as above; keel April9/21; launch Sept1/21, est.

Shawnee, hull 20, cutter USCG; 150 LOA; 30 beam; 13-6 loaded draft; 12½ loaded speed; 1000 DWT; rec engs, 1000 IHP; 2 WT boilers; keel June1/21; launch Sept1/21, est.

Ampullaria, hull 22, oil tanker Anglo-Saxon Pet Corp., Ltd; 412 LBP; 53-6 beam; 24-9 loaded draft; 11

loaded speed; 8400 DWT; rec engs, 2600 IHP; 3 Scotch marine boilers, 15-6x11-7; keel Feb5/21; launch July 2/21; deliver Aug21.

Amalthus, hull 23, oil tanker Anglo-Saxon Pet Corp., Ltd; sister to above; keel Mar12/21; launch Aug 11/21; deliver Sept20/21, est.

All cutters on transverse system; others on Isherwood system.

Canadian

CHOLBERG SHIPYARD, VANCOUVER, B. C.

Purchasing Agent: W. Meed. (These vessels to be completed by Dominion government.)

Sir Henry Drayton, hull 5, 4-masted barkentine Victoria Shipowners, Ltd; 250 LOA; 45-6 beam; 21-10 loaded draft; 2400 DWT; sailing vessel; shaft logs fitted for auxiliary but no machinery installed; keel May 15/20.

No name, hull 6, 4-masted barkentine Victoria Shipowners, Ltd; sister to above; keel June4/20.

No name, hull 7, 4-masted barkentine Victoria Shipowners, Ltd; sister to above; keel Feb/21.

J. COUGHLAN & SONS, LTD. VANCOUVER, B. C.

Purchasing Agent: J. Joseph.

Atlantic and Gulf

AMERICAN BRIDGE COMPANY, PITTSBURGH, PENN.

Purchasing Agent: W. G. A. Millar. Twenty-five coal barges Carnegie Steel Co; 175 LBP; 26 beam; 8 loaded draft; 17 launched.

Three car floats undisclosed interests; 285 LBP; 38 beam; 8 loaded draft; keel June/21; 1 delivered; 2 launch Aug21, est.

Two tow boat hulls Carnegie Steel Co; 149-2x34 4-5 loaded draft; launch and deliver Oct/21.

BALTIMORE DRYDOCK & SHIPBUILDING CO., BALTIMORE

Purchasing Agent: J. G. Miller. Elsie Jean, hull 125, tanker builder's account; 340 LBP; 49 beam; 23-6 loaded draft; 1000 loaded speed; 6000 DWT; rec eng, 2000 IHP; 2 Scotch boilers, 15-3; keel Nov24/20.

J. Macy Willis, hull 126, tanker builder's account; 430 LBP; 59 beam; 25-4½ loaded draft; 10 loaded speed; 10,250 DWT; turb eng, 3000 IHP; 3 Scotch boilers, 15-3; keel Sept 27/20.

Torrent, hull 128, fireboat City of Baltimore; 115-6 LBP; 28 beam; 9-6 loaded draft; 12 loaded speed; rec eng, 1000 IHP; 2 B&W WT boilers; keel July15/21.

BATH IRON WORKS, BATH, MAINE

Purchasing Agent: J. L. P. Burke. Thomas P. Beal, hull 86, freighter Crowell & Thurlow; 395-6 LBP; 55

Canadian Transporter, hull 20, steel freighter Canadian government; 400 LBP; 52 beam; 25-3 loaded draft; 11¾ loaded speed; 8350 DWT; TE eng, 3000 IHP; 3 Scotch boilers, 15-6 x 11-6; keel Jan6/21.

Canadian Freighter, hull 21, steel freighter Canadian government; sister to above; keel Jan6/21.

PRINCE RUPERT DRYDOCK & ENGINEERING COMPANY, PRINCE RUPERT

Canadian Scottish, steel cargo Canadian government; 8390 DWT; 2-deck; bridge, poop and forecastle; 11 speed; keel Sept27/19; launch May17/21; deliver Aug21, est.

Canadian English, steel cargo Canadian government; 8390 DWT; 2-deck; bridge, poop and forecastle; 11 speed; keel Oct20/19; launch Aug 15/21, est.

These vessels are being completed by the Wallace Shipbuilding & Drydock Co., North Vancouver. The terms are time and material plus 8 per cent.

WALLACE SHIPBUILDING & DRYDOCK CO., VANCOUVER, B. C.

Coastwise steamship Canadian Pacific; 317 LBP; 48 beam; 18½ deep; 16 knots; single-screw; 600 tons cargo space; accommodations for 200 passengers; keel Oct/20.

From the East

beam; 27-1 loaded draft; 10 loaded speed; 9600 DWT; Parsons geared turbine, 2100 SHP; 3 Scotch boilers, 15-6x11-6; keel Nov/20; launch June 16/21; deliver Aug21.

BETHLEHEM SHIPBUILDING CORP., FORE RIVER PLANT, QUINCY, MASS.

Lexington, hull 1300, battle-cruiser USN.

Raleigh, hull 1382, scout cruiser USN.

Detroit, hull 1383, scout cruiser USN.

Massachusetts, hull 1400, battle-ship USN.

And the following nineteen submarines USN: AA-2, hull 1270; hulls 1309 to 1320 inc, submarines S-18 to S-29 inc; hulls 1389 to 1394 inc; submarines S-42 to S-47 inc.

J. Fletcher Farrell, hull 1496, tanker Sinclair Nav Co; 430 LBP; 59 beam; 25-5 loaded draft; 11 loaded speed; 10,600 DWT; rec eng, 3200 IHP; 3 Scotch boilers, 15x11-9; launch June10/21.

William Boyce Thompson, tanker Sinclair Nav Co; sister to above; keel Nov1/21; launch July/21.

BETHLEHEM SHIPBUILDING CORP., HARLAN PLANT, WILMINGTON, DEL.

No name, hull 3477, tanker Atlantic Refining Co; 266 LBP; 39 beam; 17 loaded draft; 8½ loaded speed; 2600 DWT; turb eng, 750 IHP; B & W boilers; keel not laid.

BETHLEHEM SHIPBLDG. CORP., SPARROWS POINT PLANT, SPARROWS POINT, MD.

Pine Tree State, hull 4195, combination USSB; 518 LBP; 72 beam; 30-7 loaded draft; 15 loaded speed; turb eng, 10,000 IHP; 8 Yarrow boilers; keel Feb15/19; launch Mar 19/21.

Palmetto State, hull 4196; combination USSB; sister to above; keel Feb19/19; launch June4/21.

Nutmeg State, hull 4197, combination USSB; sister to above; keel July29/20.

G. Harrison Smith, hull 4210, ore and oil internat'l Pet Co; 550 LBP; 72 beam; 32-4 loaded draft; 11½ loaded speed; 20,000 DWT; rec eng 4600 IHP; 3 Scotch boilers, 17-6x12; keel July22/20; launch July12/21.

Bethore, hull 4211, ore and oil Ore SS Co; sister to above; keel Feb24/21.

Marore, hull 4212, ore and oil Ore SS Co; sister to above, except turb eng; keel May2/21.

Steelore, hull 4213, ore and oil Ore SS Co; sister to above; keel not laid.

CONSOLIDATED SHIPBUILDING CORPORATION, MORRIS HEIGHTS, N. Y.

Purchasing Agent: Wm. Rayner. Oak, hull 251, US lighthouse tender; 160 LOA; 30 beam; 9-6 loaded draft; 875 DWT; TE eng, 700 IHP; 1 Scotch boiler, 14 diam; keel Nov 22/20; launch June18/21.

Hawthorn, hull 252, US lighthouse tender; sister to above; keel Nov 22/20; launch June28/21.

No name, hull 246, US lightship; 146-3 LOA; 30 beam; 12-7 loaded draft; 825 DWT; comp eng, 400 IHP; 2 Scotch boilers, 10-6 diam; keel Mar4/21.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO., PHILADELPHIA

Purchasing Agent: Ed. C. Geehr. Richmond, hull 448, scout cruiser USN; keel Feb16/20; launch Aug15/21, est.

Concord, hull 449, scout cruiser USN; keel Mar29/20; launch Oct1/21, est.

Trenton, hull 501, scout cruiser USN; keel Aug18/20; launch Nov1/21, est.

Marblehead, hull 502, scout cruiser USN; keel Aug4/20; launch Dec 1/21, est.

Memphis, hull 503, scout cruiser USN; keel Oct14/20; launch Feb1/22, est.

DOULL & WILLIAMS SHIP- BUILDING COMPANY, NEW ORLEANS

Purchasing Agent: Roland A. Thomas.

Six oil-carrying steel barges for builder's account; 40x175x9; 1000 DWT; two launched in July; four in August; no heating coils, piping or propelling machinery.

FEDERAL SHIPBUILDING CO., KEARNY, N. J.

Purchasing Agent: J. L. Hastings. Victrolite, hull 49, tanker for Standard Oil of NJ; 500 LBP; 68 beam; 27-6 loaded draft; 11 loaded speed; 15,000 DWT; rec engs, 3500 IHP; 3 Scotch boilers, 16 diam; keel July22/21; launch June14/21; deliver July8/21.

J. A. Moffett Jr, tanker Standard Oil of NJ; sister to above; keel July 23/20; launch July14/21; deliver Aug5/21.

Steel Seafarer, hull 43, freighter US Steel Products Co; 425 LBP; 56 beam; 25-10 loaded draft; 12 loaded speed; 9400 DWT; turb engs, 3100 IHP; 3 Scotch boilers, 15 diam; keel May25/21; launch Oct15/21, est; deliver Nov5/21, est.

Steel Pathfinder, hull 44, freighter US Steel Products Co; sister to the above; keel June1/21; launch Nov 12/21, est; deliver Dec3/21, est.

Steel Pioneer, hull 45, freighter US Steel Products Co; sister to the above; keel July21; launch Dec10/21, est; deliver Dec31/21, est.

GLOBE SHIPBUILDING & DRY- DOCK CO. OF MARYLAND, BALTIMORE

Purchasing Agent: H. B. McCauley. San Leopoldo, hull 101, oil carrier Eagle Oil Transport Co; 401 LBP; 54 beam; 25-1 loaded draft; 10½ loaded speed; 8600 DWT; TE engs, 2800 IHP; 3 Scotch boilers, 15-3x 11-6; keel Sept20; launch June25/21; deliver Aug15/21, est.

San Leonardo, hull 102, oil carrier Eagle Oil Transport Co; sister to above; keel Sept20; launch July8/21; deliver Aug15/21, est.

LAKE TORPEDO BOAT CO., BRIDGEPORT, CONN.

S-48, hull 48, submarine USN; launch Feb26/21.

S-49, hull 49, submarine USN; launch Apr23/21.

S-50, hull 50, submarine USN; launch June18/21.

S-51, hull 51, submarine USN.

MERCHANT SHIPBUILDING COR- PORATION, CHESTER, PENN.

Vice-President: J. L. Ackerson. Playa, hull 382, tanker Union Oil Co; 424 LBP; 58 beam; 25-5 loaded draft; 10½ loaded speed; 10,000 DWT; TE engs; 3 Scotch boilers, 15-3 x11-7; keel July22/20; launch June 4/21; deliver July2/21.

Robert E. Hopkins, hull 383, tanker Tidewater Oil Co; sister to above; keel Aug30/20; launch Aug6/21.

Samuel Q. Brown, hull 384, tanker Tidewater Oil Co; sister to above; keel Oct1/20.

No name, hull 385, freighter American-Hawaiian SS Co; 445 LBP; 59-8 beam; 28-6 loaded draft; 11½ speed; 11,000 DWT; 2 6-cyl, 4-cycle Diesel engs, 4500 metric; 1 vertical donkey, 400 sq ft HS; keel Feb5/21.

No name, hull 386, freighter American-Hawaiian SS Co; sister to above;

keel Feb10/21; launch July21, est. No name, hull 387, fireboat City of Philadelphia; 120-9 LOA; 28 beam; 12-9 deep; 9 loaded draft; comp eng, 500 IHP; 2 B&W WT boilers, oil; 4 turbine fire pumps, 1 30-foot tower, 2 15-foot towers; capacity 12,000 gals a minute.

NAVY YARD, BOSTON

Pecos, fuel ship No. 18, USN; 455 LBP; 56-2 beam; 26-8 normal draft; 14 loaded speed; 14,800 normal disp; rec eng, 5200 IHP; 4 Ward WT boilers; keel June2/20; launch Apr23/21; deliver Sept21, est.

Whitney, destroyer tender No. 4 USN; 460 LBP; 60-11 beam; 21 normal draft; 16 loaded speed; 10,600 normal disp; geared Parsons turbs, 7000 SHP; 2 WT exp small tube boilers; keel Apr23/21; launching indefinite.

NAVY YARD, PHILADELPHIA

Dobbin, hull 7, destroyer tender USN; 460 LBP; 60-10 beam; 21 loaded draft; 16 loaded speed; 10,600 tons disp; Parsons geared turb single screw engs, 7000 SHP; 2 WT boilers; keel Dec23/19; launch May 5/21; deliver date not determined.

Constitution, hull 8, battle cruiser USN; 850 LBP; 105-4 beam; 30-11½ loaded draft; 33½ loaded speed; 43,500 disp; electric drive, 180,000SHP; 16 WT boilers; keel Sept25/20; launch and deliver dates not determined.

United States, hull 9, battle cruiser USN; 850 LBP; 105-4 beam; 30-11½ loaded draft; 33½ loaded speed; 43,500 disp; electric drive, 180,000 SHP; 16 WT boilers; keel Sept25/20; launch and deliver dates not determined.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY, NEWPORT NEWS

Purchasing Agent: James Plummer, 233 Broadway, New York City. West Virginia, hull 211, battleship USN; 600 LBP; 97-3½ beam; 30-6 mean draft; 32,600 normal disp; 21 speed; GE turbo-elec drive, 28,900 SHP; 8 B&W WT boilers, oil, 41,768 sq ft plus 4168 superheat; keel Apr 12/20; launch Nov21, est; deliver Dec2/21, est.

Constellation, hull 215, battle cruiser USN; 850 LBP; 101-8½ beam; 31 mean draft; 43,500 normal disp; 33½ speed, est; Westinghouse turbo-elec drive, 180,000 SHP; 16 WT boilers, oil, 198,000 sq ft plus 18,000 superheat; keel Aug18/20; launch and deliver dates not est.

Ranger, hull 215, battle cruiser USN; sister to above; keel June23/21; launch and deliver dates not est.

Iowa, hull 258, battleship USN; 660 LBP; 105 beam; 33 mean draft; 43,200 normal disp; 33 speed; GE turbo-elec drive, 60,000 SHP; 12 White-Forster WT boilers, oil, 82,800 sq ft plus 8940 superheat; keel May17/20; launch and deliver dates not est.

John D. Archbold, hull 261, tanker Standard Oil NJ; 555 LBP; 75 beam; 30 loaded draft; 10½ loaded speed; 20,300 DWT; twin screw, TE eng, 3800 IHP; 3 Scotch boilers, 17x12; keel Dec15/20; launch Aug/21, est; deliver Oct/21, est.

William Rockefeller, hull 262, tanker Standard Oil NJ; sister to above; keel Dec15/20; launch Oct/21, est; deliver Dec/21, est.

NEW YORK SHIPBUILDING CORPORATION, CAMDEN, N. J.

Purchasing Agent: L. G. Buckwalter.

Southern Cross, hull 241, combination USSB; 534 LBP; 72 beam; 30-6 loaded draft; 18 loaded speed; 11,000 DWT; geared turbs, 12,000 SHP; 8 WT boilers; keel Aug/18; launch July20/19; deliver fall/21, est.

Bay State, hull 251, combination USSB; 534 LBP; 72 beam; 30-6 loaded draft; 18 loaded speed; 11,000 DWT; geared turbs, 12,000 SHP; 8 WT boilers; keel Oct15/19; launch July17/20; deliver winter/21, est.

Peninsula State, hull 252, combination USSB; sister to above; keel July20/20; launch July6/21; deliver spring/22, est.

Lone Star State, hull 255, combination USSB; sister to above; keel May13/19; launch Oct23/20; deliver fall/21, est.

Hoosier State, hull 256, combination USSB; sister to above; keel May20/19; launch Oct23/20; deliver fall/21, est.

Yankee Arrow, hull 260, bulk oil Standard Trans Co of NY; 468 LBP; 62-6 beam; 27-0½ loaded draft; 10½ loaded speed; 12,550 DWT; 4 cyl QE engs, 3200 SHP; 3 SE Scotch boilers, 15-2x11-6; keel Aug17/20; launch Apr10/21; deliver summer/21, est.

Empire Arrow, hull 261, bulk oil Standard Trans of NY; sister to above; keel Sept14/20; launch May24/21; deliver summer/21.

Levant Arrow, hull 262, bulk oil Standard Trans Co of NY; sister to above; keel Nov4/20; launch July25/21; deliver fall/21, est.

No name, hull 263, combination Munson SS Co; 414 LBP; 57-6 beam; 23 loaded draft; 15½ loaded speed; 4950 DWT; geared turbs, 5800 SHP; 5 SE Scotch boilers, 16-4x12-3; keel Sept30/20; launch fall/21, est; deliver winter/21, est.

Eurana, hull 264, bulk oil stock; 415-3 LBP; 56-3 beam; 25-¾ loaded draft; 10½ loaded speed; 9870 DWT; 3 cyl TE engs, 3000 SHP; 3 SE Scotch boilers, 15-10x11-4; keel Jan17/21; launch July16/21; deliver winter/21.

No name, hull 265, bulk oil stock; sister to above.

Dixie Arrow, hull 266, bulk oil Standard Trans Co of NY; 468 LBP; 62-6 beam; 27-0½ loaded draft; 10½ loaded speed; 12,550 DWT; 4 cyl QE engs, 3200 SHP; 3 SE Scotch boilers, 15-3 x 11-6; keel Aug11/20; launch fall/21, est; deliver winter/21, est.

Saratoga, hull 199, battle cruiser USN; 874 LOA; 850 LBP; 105-5¼ extreme beam; 31 mean draft; 43,500 normal disp; 33¼ loaded speed; GE turbo-electric drive; 180,000 SHP; 16 WT boilers, 198,000 sq ft plus 18,000 superheat; keel Sept25/20.

Colorado, hull 200, battleship USN; 624 LOA; 600 LBP; 97-3½ beam waterline; 30-6 mean draft; 32,600 normal disp; 21 loaded speed; Westinghouse turbo-electric drive, 28,900 SHP; 8 B&W WT boilers, 41,678 sq ft plus 4169 superheat; keel Mar29/19; launch Mar22/21.

Washington, hull 201, battleship USN, sister to above; keel June30/19; launch Sept/21, est.

Hull 267, fuel ship Japanese Navy; 497-8 LOA; 67 beam; 28 designed draft; 15 loaded speed; 13,000 DWT; elec drive, 8000 SHP; 4 B&W boilers; keel fall/21, est.

STANDARD SHIPBLDG. CORP., SHOOTERS ISLAND, MARINERS HARBOR, N. Y.

Purchasing Agent: Jamie Cortada. John Purroy Mitchell, hull 32, fireboat City of New York; 121 LBP; 27 beam; 14-9 deep; 12 loaded speed; comp eng, 900 IHP; 2 B&W WT boilers, oil burning; keel Mar31/21; launch Aug6/21.

STATEN ISLAND SHIPBUILDING COMPANY, STATEN ISLAND, NEW YORK

Purchasing Agent: R. C. Miller. Dixiano, hull 726, sugar ship Am Sug Ref Co; 360 LBP; 50 beam; 21 loaded draft; 10 loaded speed; 6300 DWT; TE eng, 2000 IHP; 2 Scotch boilers, 15x11; keel Sept9/20; launch May21/21.

Hell Gate, hull 728, dredge C. R. Browning; 140 LBP; 48 beam; 15 loaded draft; keel Aug28/20; launch Feb23/21.

Socony 114, hull 734, barge Stand Oil of NY; sister to above; keel Jan10/21; deliver July9/21, est.

Socony 115, hull 735, barge Stand Oil of NY; sister to above; keel Feb26/21; deliver July30/21, est.

Hull 736, tugboat Staples Trans Co; 136½ LBP; 27 beam; 16½ loaded draft; 10 loaded speed; 1 TE eng 700 HP; 1 Scotch boiler, 16x11½; keel May16/21; launch July30/21, est; deliver Sept15/21, est.

President Roosevelt, hull 737, ferryboat City of New York; 247 LBP; 66 beam; 19½ loaded draft; 15 loaded speed; 1 F&A comp eng, 3500 HP; 4 B&W WT boilers, 13,000 sq ft; keel May23/21; launch July16/21.

Northwestern, tanker Am Pet Co; 242 LBP; 42 beam; 23 loaded draft; 10 loaded speed; TE eng; 2 Scotch boilers; lengthening job, additional 56 ft. making 2 new cargo tanks, 1000 DWT additional capacity. Vessel considered total loss by fire; raised; and now undergoing general repairs and at the same time lengthening. Job started May31/21; estimated time 4 months.

SUN SHIPBUILDING COMPANY, CHESTER, PENN.

Purchasing Agent: H. W. Scott. J. N. Pew, hull 39, tanker Sun Oil Co; 480 LBP; 65-9 beam; 26-7 loaded draft; 10½ loaded speed; 12,800 DWT; single screw QE engs, 4300 IHP; 3 SE Scotch boilers, 15-10x11-1¼; keel Nov5/20; launch Apr23/21.

Agwiharve, hull 40, tanker A. G. W. I. S. Co; 480 LBP; 65-9 beam; 26-7 loaded draft; 12 loaded speed; 12,500 DWT; single screw QE engs, 4300 IHP; 4 SE Scotch boilers, 15-10x11-1¼; keel Nov26/20; launch Apr2/21.

Agwimex, hull 41, tanker A. G. W. I. S. Co; sister to above; keel Dec8/20; launch Aug6/21.

Agwiscot, hull 42, tanker A. G. W. I. S. Co; sister to above; keel Dec23/20; launch July2/21, est; deliver July30/21, est.

Agwistates, hull 43, tanker A. G. W. I. S. Co; sister to above; keel Jan3/21; launch July16/21, est; deliver Aug15/21, est.

No name, hull 46, tanker Sun Oil Co; 480 LBP; 65-9 beam; 26-7 loaded draft; 10½ loaded speed; 12,800 DWT; single screw QE engs, 4300 IHP; 3 SE Scotch boilers, 15x11-1¼; keel Apr21; launch Aug30/21, est; deliver Sept30/21, est.

No name, hull 47, tanker Sun Oil Co; sister to above; keel Apr/21; launch Sept3/21, est; deliver Oct3/21, est.

TERRY SHIPBUILDING CORP., SAVANNAH

Purchasing Agent: H. A. Bittner. Hull 69, oil-barge builders' acct; 285 LBP; 44 beam; 21 loaded draft; 3500 DWT.

Hulls 70, 71, 72; sisters to above; work suspended.

TEXAS STEAMSHIP COMPANY, BATH, MAINE

Purchasing Agent: A. R. Weber. No name, hull 32, tanker Texas SS Co; 415-10 LBP; 56 beam; 25-7¾ loaded draft; 11½ loaded speed; 9600 DWT; TE engs, 3000 IHP; 3 Scotch boilers, 15-3x11; keel Nov9/20.

Canadian

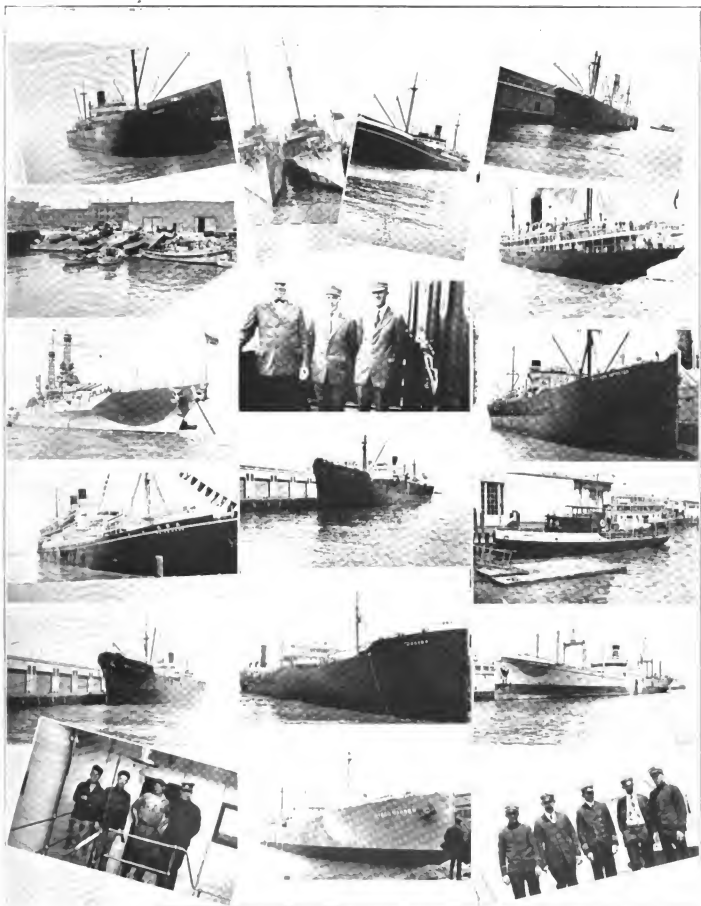
CANADIAN VICKERS, LTD., MONTREAL

Topdalsfjord, hull 82, single-screw steel 2-deck cargo Norwegian-American Line; 365 LBP; 49½ beam; 29 loaded draft; 11½ loaded speed; 6400 DWT; TE engs, 2600 IHP; 3 Scotch boilers, 14-9 with superheaters; keel July29/20; launch May5/21.

DAVIE SHIPBUILDING & REPAIRING COMPANY, LTD., LAUZOON LEVIS, P. Q. CANADA

Purchasing Agent: N. W. Van Wyck.

SNAPS ALONG THE WATER FRONT



Photos by Getty

Left row, top to bottom—Wilbilo, Williams Line; Fishermen's Wharf; U. S. S. New Mexico; Taiyo Maru, Toyo Kisen Kaisha; West Calera, Struthers & Dixon; engineers, Steel Ranger, Isthmian Line. Center row—Destroyers Sicard and Sigourney; Robin Adair, Isthmian Line; deck officers, Robin Adair; West Henshaw, Struthers & Dixon; Salina, Struthers & Dixon; Steel Ranger, Isthmian Line. Right row—Arizonan, American-Hawaiian; Marama, Union Steamship Company of New Zealand; Eastern Importer, Pacific Mail; Suison, U. S. Engineers; Lewis Luckenbach, Luckenbach Line; deck officers, Steel Ranger.

Canadian Challenger, hull 476, single-screw cargo Canadian government; 400 LBP; 52 beam; 25-3 loaded draft; 11½ loaded speed; 8350 D WT; TE surface cond engs, 3000 I HP; 3 Scotch marine boilers, 15-6x 11-6; keel May14/20; launch July 7/21.

NOVA SCOTIA STEEL & COAL CO., TRENTON, N. S.

Purchasing Agent: A. M. Seely. Sea King, hull 9, exploring yacht Baron Bliss, Nassau, Bahamas; 137-10 LBP; 28-6 beam; 6 loaded draft; 7 loaded speed; semi-Diesel 440 BH P, twin-screw eng; keel Aug24/20; launch Aug18/21, est; deliver Sept 30/21, est.

Drydocking and Repairs

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Potrero Works

Miscellaneous repairs, drydocking, painting: Santa Fe Barges 3 and 4, Standard Oil Barge 7, Despatch 3, Helen P. Drew, Yorba Linda, West Honaker, Echo, Water Nymph, El Dorado, Golden State, Shabonee, West Ira, Newport, Katherine McCall, Namasket, Captain A. F. Lucas, West Carmona, Narcissus. Miscellaneous repairs: Kokai Maru, Lewis Luckenbach, Phoenix, Hawkeye State, Empire State, Coquille River, Arctic, Brunswick, Sonoma, Speaker, Tofuku Maru, Plaudis, Auther, Indien, S. C. T. Dodd (also drydocking for examination). Repairs to feed pump: Colusa. Installing discharge strainer: Wm. G. Warden. Engine, boiler, hull repairs: Orowaiti, Cape Henry (not hull), Marama, Frank H. Buck. Miscellaneous repairs, turbines, boilers: Alaska. Installing new condenser: Coalinga. Renewing Fidelity top: Col. E. L. Drake. New slide valve for main engine: Royal Arrow. Engine, boiler, hull repairs, drydocking and painting: W. S. Porter (also removing and repairing rudder), Mazatlan, Arab, Frank G. Drum. Drawing tailshaft, retubing boilers, miscellaneous repairs, drydocking, painting: Mexico. Repairing dynamo engine: Caddo. Repairing whistle: Rose City. Repairing captain: Carloss.

Alameda Works

Miscellaneous repairs: W. S. Miller, San Diego, Avalon. Miscellaneous repairs, drydocking, painting: Resolute, Ranger, Daisy (also repairing stack), Daisy Putnam, Daisy Gadsby, Daisy Matthews, Hornet and Vanguard (also new tailshaft), Malahat, Fred J. Wood, Acme, Trident. Miscellaneous repairs, drydocking, painting, removing and replacing propeller: Oregon, Davenport, Tahoe (installing new propeller). Drydocking and painting: F. S. Loop.

FEDERAL SHIPBUILDING COMPANY, KEARNY, N. J.

Miscellaneous repairs: Santa Ve-

ronica, Steel Mariner, Steel Voyager, Birmingham City and Steel Engineer (also painting), Santa Eulalia, Santa Isabel, S. V. Harkness and Josiah Macy (also installation of new reduction gears). Miscellaneous repairs, cleaning, painting: Bantu (also new deck winches), Steel Maker, Steel Exporter, Mobile City, Ensley City, Sutermeo and Suholco (underwater repairs), Tugs Federal 1 and 2.

MOORE SHIPBUILDING COMPANY, OAKLAND

Drydocking, cleaning, painting and miscellaneous repairs: El Aquario, Anne Hanify, Santa Barbara, Wilmington, Coalinga, Santa Fe Barges 1 and 2, Edward T. Jeffery, Westport, Santa Cruz, Pedro Costa, Luzon, South Coast, Columbia, Fred Baxter (no painting). Engine repairs: West Togos, Sonoma, Ventura, West Lewark, Hawkeye State (also boiler). Drydocking, cleaning, painting, miscellaneous hull repairs: Saleier (also engine), Colona, Forester, Commerce, Thomas, Janelew, Horace Baxter. Miscellaneous repairs: Granite State, Golden State, West Momentum (also drydocking). New propeller blades: Atlas. Installing oil burning system: Celestial.

NAVY YARD, PUGET SOUND

Drydocking, cleaning bottom, miscellaneous repairs: Texas (also painting bottom), Coal Barges Nos. 158, 172, 370, 371, 374, 376, 389, 391. Miscellaneous repairs: Idaho, Mississippi, New York, Arkansas, New Mexico, Wyoming. Ammunition ship Pyro, Destroyers Rathburne, Waters, Dorsey, Talbot, Roper, Zane, Bailey, Thornton, Morris, Meade, Swasey, Tingey, Minesweeper Swallow, Radio repair ship Saturn. Docking, renewal of stern frame, miscellaneous repairs: West Jessup. Miscellaneous repairs incident to operation as district craft: Patrol boat Eagle 57, Tugs Pawtucket, Sotoyomo, Iroquois,

Tatnuck, Mahopac. Care and preservation: Oregon (out of commission), Seattle, Missoula, Charlotte, Patrol Boat S. C. 310.

PORT ARTHUR SHIPBUILDING CO., LTD., PORT ARTHUR, ONTARIO, CANADA

Repairs to bow: Laketon. Repairs to bottom: Kyro Scow. Repairs to rudder: J. H. G. Hagarty, Jas. Whalen, Empire. Miscellaneous repairs: Canadian Harvester, Sarnia, A. F. Bowman.

SOUTHWESTERN SHIPBUILDING CO., EAST SAN PEDRO

Miscellaneous repairs: Cuba, West Calera, Lompoc. Turbine repairs: Hawkeye State. Repairs to main steam pipe: Stanley Dollar.

TODD DRY DOCKS, INC., SEATTLE

Drydocking, cleaning, painting: Yosemite, Admiral Farragut, Redwood, Lyman Stewart (painting only), Eldridge, Roosevelt. Miscellaneous repairs: Barge Commodore, Westerly, Sioux, Silver State, Wenatchee and Keystone State (also betterments), Aquilo, Forest T. Crosby, Andrea Luckenbach, Teucer, C. M. & St. P. barge 6, W. T. & B. Co.'s barges 6, 30, 44, 43, 46, Chlicothe, West Ison. Installing lower half stern frame: West Jester. Voyage repairs: Major Samuel Ringgold, Effingham. Hull repairs: Norwood. New wheel: Kingston. Inspection of turbine bearings: Lewis Luckenbach.

THE WINSLOW MARINE RAILWAY & SHIPBUILDING CO., INC., SEATTLE

Drydocking, cleaning, painting: Barge Granco, Alicia Haviside, Santa Inez, Skookum (no docking). Drydocking, cleaning, painting, general repairs: Barge Baroda, Mindiao. Docking, cleaning, painting, renewing shoe, caulking butts and seams, repairs to donkey boiler: Bainbridge.



New combination vessel Rekuyo Maru of the Toyo Kisen Kaisha's South American line. She is equipped with 5 Scotch boilers and Parsons geared turbines, which drive her at 16 knots, half-loaded draft; she is rubber-decked, twin-screw, 460 feet between perpendiculars, 60 feet in molded beam, and 32 feet 6 inches deep to the upper deck. Her gross is 9418 tons and her net 5678; her cargo capacity is 12,428 tons measurement and 12,660 deadweight. Passenger accommodations are provided for 46 first, 31 second and 612 steerage. The Rekuyo Maru was designed by M. Ichiohara of the T. K. K. and was built by the Nagasaki works of the Mitsubishi Shipbuilding Company.

The Japanese Strikes

Of late the outstanding development of the Orient has been the unusual labor disturbances of Japan, which center in the Kawasaki and Mitsubishi shipyards at Kobe. These strikes have passed the stage of being merely shipbuilding news and have become instead international news of great consequence, inasmuch as correspondents of American papers and press associations are inclined to see in them the harbingers of a new order of things in the Sunrise Kingdom. Such they may be; nevertheless, it would be easy to attribute far too much importance to them, and it certainly would be absurd to deduce from them the existence of any revolutionary trend. So long as the Emperor of Japan occupies his unique position in the hearts and minds of his subjects, a position that can truthfully be said to be that of both Pope and Kaiser magnified, just so long will Japan remain steady, even though premiers rise and fall and some form of socialism succeed the old order.

An Emotional People

Such events are by no means near. The strikes appear grave because they are practically of unprecedented magnitude. What of it? The Kobe rice riots of 1918, if duplicated in the United States, would be exceedingly serious symptoms of popular unrest; in Japan they meant nothing more than that an emotional people had run amuck and had quieted almost immediately. For the fact remains that the Japanese is emotional and excitable. As for the



Winches of the T. K. K. steamship Rakuyo Maru

Kobe strikes, other factors have entered in, among which is the narrow margin between earning power and cost of living. Moreover, the occupation of factories by Italian workers unquestionably has had its effect on Japan. "The Italians did it; why can't we?" one can imagine the Kobe strikers saying to themselves; and forthwith they imitated the Occidental example. This they were prone to do because labor organizations especially look to the West for example and guidance in details the most petty. For example, in 1919

typesetters of Tokyo bethought themselves that a union would be desirable, and in order to have all as it should be they sought advice from Americans as to where a copy of the constitution of the International Typographical Union might be had. Other instances doubtless could be related by different individuals. In this there is little strange, because Japan is only now emerging from a home-production, semi-feudal system, one of the prominent features of which is a paternal attitude on the part of the employer, manifested in the granting of benefits when workmen have to be discharged.

"Fires of Straw"

An editorial of the Japan Advertiser contains a summary of the situation, in part as follows:

"Labor was not, until yesterday, regarded as a commodity in Japan. The relation of employer and employee was not that of buyer and seller, united only by the cash nexus and submitting to the law of supply and demand. It was a relation of master and servant, and was interpreted by the relations of the family. The old conception is dying with the displacement of the individual master by the limited company, but it still survives, and capitalists as well as workers are to be found arguing that the Japanese onryo shugi (kindness principle) should govern the relations of capital and labor instead of the soulless individualism of supply and demand. To turn faithful servants out of the workshops where they spend their lives in your service seems to the simple Japanese workman about as mean an action as turning a child



First-cabin lounge, Rakuyo Maru

out of the house. In going to the workshops they are not thinking of taking possession of them in order to acquire the ownership; they are merely making use of the place where they earned their daily bread in the past and hope to earn it again when the "unfortunate affair" is over. . . . Whether it (the labor movement in Japan) develops safely or dangerously depends entirely upon the method in which labor is dealt with. The main Japanese industry is still agriculture and the family system makes it easy to absorb the margin of unemployed when crises occur in the factory industries. If the government has not shown any special anxiety to guide labor it has not specially persecuted it. Police stupidity has been expended upon a few intellectuals. The Japanese populace is capable of sudden flares of anger like the political riots of 1912 and the rice riots of 1916, but they are fires of straw. The instincts of the people are submissive and loyal. The subversive idea that Jack is as good as his master has made little head way in Japan. The rise of labor, if the situation is wisely and liberally dealt with, need involve no danger to the state. That will be as it will be, but at present there is no reason for alarm."

Statement of Strikers

The following statement was issued by the Kawasaki strikers when they seized the shipyard:

"If, because the company has been insincere and arrogant, we should continue our strike as a protest, Japan's industry will decline and it will cause a social unrest. We therefore shall do our duty at our respective posts until our demands are granted and shall jointly control the plant and keep it working going.

"1. An industrial commission shall exercise control over all the service.

"2. Each worker is expected to do his duty at his post assigned by the commission. In case of necessity he shall be requested to serve on the commission.

"3. Wages shall be paid as before by the management of the company.

"4. The hours of labor shall be six hours at present. In that time, as much efficiency as shown in eight hours shall be shown. In case the commission deems it necessary, the hours may be shortened or lengthened.

"5. Any one violating the general peace of the plant or impairing the efficiency of the work shall be turned over to the disciplinary committee to be properly punished."

Chronology of Events

The principal steps of the strike were as follows:

June 24—Employees of the motor department of the Mitsubishi Company demand that organization of a

union be permitted; that wages be increased 50 sen (25 cents) or more; that half-wages be paid while employees are in the army; that no workman shall be dismissed as a result of the demands; that an eight-hour system supplant an nine-hour; that dismissed workmen receive four months' extra wages. Company declines to grant demands.

July 5—Demands for recognition of a union are made by Kawasaki workmen. One thousand men of the electrical department first affected. Kobe Iron Works also involved. Mitsubishi again refuses to accede. Strike at works of Takekawa Rubber Company.

July 7—Mitsubishi works closed. July 8—Twenty thousand Kawasaki workmen strike and parade with red flags. Workmen and private police of the company fight.

July 12—Kawasaki workmen enter plant and expel foremen and superintendents. Executive committee assumes control. Riots at Mitsubishi yard.

July 14—Battalion of infantry sent to Kawasaki yard. Company announces closing of works for three days, half-pay to be granted the men. Strikers prevented by police and troops from entering yard. Kawasaki plant at Fukui closed for three days.

July 19—Employees of government arsenals in Tokyo reported to be forming union. Light cruiser building at Mitsubishi yard flooded with salt water.

July 20—Mitsubishi president, Baron Iwasaki, refuses to meet strike committee.

July 21—Three hundred Kawasaki foremen join strikers. Mitsubishi closing extended indefinitely. Rubber strike in Kobe settled; victory for men.

July 22—Strike leaders of Kubota iron works, Osaka, discharged.

July 24—About one-third of the Kawasaki strikers return to work unconditionally. These men granted increase in wages. Mitsubishi yard reopened, but with few employees.

July 26—About 3500 employees of the Ishikawajima yard, Tokyo, organize union, a principal object being an eight-hour day.

July 27—An additional 4800 Kawasaki strikers return to work.

Japanese Building

Seven million yen, approximately \$3,500,000, is being expended by the Imperial Japanese Railways on new ferryboats. Two for the Shimonoseki-Fusan service are under construction at the Mitsubishi yard,

Kobe, one to be launched in March, 1922, and the other in December of the same year. In these vessels Sperry gyroscopic stabilizers will be installed. Other and smaller vessels are building for the Aomori-Hakodate, Shimonoseki-Moji and Uno-Takamatsu services.

Two vessels of 1000 gross tons or more were launched during June, one of 2600 tons by the Osaka Iron Works for the Osaka Shosen Kaisha and the other of 6500 tons by Kawasaki. Ten vessels of 42,470 tons gross were launched during June, 1920. In the first six months of 1920 sixty vessels of 283,755 were launched, as against twenty-seven of 144,250 in the corresponding period of 1921. One vessel exceeding 1000 tons was to be launched in July and none in August and September.

The Iron and Steel Industry Encouragement Law passed by the last Diet became effective July 20. In spite of the Diet's action in remitting duties on shipbuilding materials, bounties are being granted on various kinds of domestic steel used in shipbuilding, the rate being 12 per cent ad valorem on billets and 15 per cent on different plates, shapes, tubes, etc. Values will be fixed by the minister of agriculture and commerce on the basis of import prices.

Should disarmament or restriction of naval construction be attained by the Washington conference, Japanese shipyards will be affected greatly. The depression in merchant shipping and shipbuilding has made naval work of much larger importance than it was a few years ago. The principal yards affected would be: Kawasaki, Mitsubishi, Uraga, Ishikawajima, Fujinagata, Asano Iron Works, Yokohama Dock, Asano.

The Asano Shipbuilding Company, Tsurumi, has completed the electric-drive steamship Biyo Maru for the Toyo Kisen Kaisha. She is 400 feet by 53 by 22; has a loaded draft of 25 feet 9 inches, a gross tonnage of 5479 and a sea speed of 11 knots. She is of the shelter-deck type with machinery amidships. The Ljungstrom turbines drive a generator each, and the current is supplied to two induction motors that drive the propeller shaft through single gearing of the double helical tooth pattern. The turbines are of the radial-flow, double-rotation design and work with steam at 225 pounds, superheated to 650 degrees. The generators are three-phase alternating.



Steel and the Pacific

Business men of the Pacific Coast who are interested in reviving the movement of steel through their ports to the Orient apparently have only one course open. That is to obtain a railroad rate from Chicago to the Pacific Coast of about 60 cents as against today's rate of 71. Even a 9-cent reduction might not be permanently efficacious, but nothing less, in existing circumstances, offers hope. At the same time, while working for a 60-cent rate from Chicago, Pacific Coast exporters might as well reconcile themselves to the loss of all business originating in Pittsburgh. In the more remote future steel from that city might seek the overland route again, but not today or tomorrow.

\$5 a Ton Trans-Pacific

At the present time the trans-Pacific steel rate is \$5, a reduction of 88 cents having been made a few weeks ago. This rate approaches too closely to the cost of transportation for steamship lines to make any additional reductions, especially in view of the fact that Singapore and Saigon, which are not, in the old meaning of the phrase, Oriental ports, also are covered by the tariff. The overland railroad rate from Chicago is 71 cents, or \$14.20 a short ton, the total being \$19.20, plus various charges at Pacific ports. The Pittsburgh overland charge would be 80 cents a hundred, plus \$5 trans-Pacific, or \$21. These costs are to be compared with the following: Pittsburgh to New York, \$7.60 a short ton, plus \$12 steamship rate a long ton, or \$10.70 a short ton, the total being \$18.30. Pittsburgh to Philadelphia, \$7 a short ton, the total rail and water being \$17.70. Pittsburgh to Baltimore, \$6.70 a short ton, the total being \$17.40.

Even a cursory examination of these figures discloses the commanding position of Baltimore, to which not enough attention has been paid by trans-Pacific operators, most computations having been based on New York. But even in the case of New York it is evident that Pittsburgh steel enjoys a rate \$2.70 cents less than that offered by the transconti-

ental-Pacific Coast routing; and for Philadelphia and Baltimore the differential is greater. These figures tell briefly why Pittsburgh must be foregone at this time.

Chicago Is Different

Chicago, however, is situated differently. Something might be accomplished in that district, in which are the great mills of South Chicago and Gary. The Chicago-Pacific Coast rate is \$14.20 a short ton, the total rail and water charge being \$19.20. Against this is to be set a Chicago-New York rate of 63 cents, or \$12.60 a short ton; and the total is no less than \$23.30. In brief, the differential against Chicago steel moving via a Pacific port is 90 cents a ton and via New York the differential is \$5, Pittsburgh steel moving via New York being the basis of comparison in both cases.

What opportunity has Chicago steel to move to the Orient in these circumstances? Practically none. The United States Steel Corporation might choose to fill an order at Gary and absorb the freight differential, inasmuch as all quotations are on a Pittsburgh basis; but it is evident that such a course would be dictated by unusual circumstances and could not be expected often. The normal event would be for Gary to supply the domestic markets and for Pittsburgh to meet whatever foreign demand there might be.

The Only Hope

But if Pittsburgh is to fill all Oriental orders, the Pacific Coast is shut out of the business completely. Therefore, the Chicago rate structure must be rectified, so as to equalize its mills, as well as those of Birmingham, with Pittsburgh producers. In any such change Baltimore must be taken as the standard Atlantic port, since its railroad rate from Pittsburgh is the lowest. As was stated before, the total cost of moving a ton of steel via Baltimore is \$17.40. If the present trans-Pacific rate of \$5 is to be maintained, the transcontinental railroads could equalize Chicago-Pacific Coast steel with Pittsburgh-Baltimore by reducing their tariff to 62 cents, which, however, would leave the trans-Pa-

cific lines with no leeway whatever short of cutting the \$5 rate. For that reason 60 cents is suggested as giving a margin of 2 cents a hundred, or 40 cents a short ton, within which the trans-Pacific operator might move.

If the railroads can make a 60-cent rate, or even less, and then say in so many words to the steamship lines: "We have gone as far as we can go," in such an event the situation would be clarified and the Pacific Coast would know precisely what it could do in the face of any changes brought about by the Atlantic-Orient lines. If the ruling direct rate of \$10.70 a short ton were reduced by an amount greater than the margin allowed by the railroad tariffs, then the trans-Pacific steamship lines would cease all effort to get business, knowing that the railroads could go no lower. To this scheme the objection might be made that the direct steamship lines would be aware of the irreducible minimum existing, and therefore would cut their rates again. So they might; and the Eastern railroads also might slash that Chicago-New York rate of 63 cents. What if either possibility developed into an actuality? The Pacific Coast would be in no worse a situation than today, when it gets no Pittsburgh steel.

\$1 a Ton at Panama

Even the Atlantic-Orient steamship lines, however, cannot reduce their rates indefinitely. They have approached bedrock about as closely as have the trans-Pacific companies. Their steel tariff, North Atlantic to Far East, is \$10.70 a short ton, from which must be deducted an average Panama Canal toll of about \$1 a cargo ton, the net receipts from each ton of steel being \$9.70. In order to earn this amount the steamship company must transport the steel 10,000 miles to Yokohama and even farther to Hongkong or Singapore, whereas the direct distance from Seattle to Yokohama is 4200 miles and from San Francisco to Yokohama 4600. In other words, the North Atlantic lines are receiving less a ton-mile than are the trans-Pacific carriers, although the latter

are delayed longer in port to the mileage steamed at sea and port dues, etc., would be heavier in proportion to the cargo carried, inasmuch as voyages are shorter and calls therefore more frequent. (With reference to the Panama tolls a cargo ton: for June the average for all vessels was \$1.02, for May 97 cents and for April 93 cents, although the Isthmian Line's Steel Ranger, which passed through the canal in June en route from New York to San Diego, paid only 48 cents tolls for every ton of cargo carried.)

In this discussion no account has been taken of tolls at the different ports, of greater or less marine insurance, of quicker dispatch or of delay in receiving ocean bills of lading when shipment is made via the Pacific Coast. All these elements would have to be weighed in any given case, but their interactions and reactions are too complicated for consideration here.

While practically no cargo is moving from Pittsburgh via the Pacific Coast, the Atlantic is shipping great tonnages. The following table shows the number of long tons moving from the Atlantic to the Orient via Panama during the first six months of the year:

Month	Long Tons
January	22,000
February	22,000
March	40,000
April	32,000
May	18,000
June	20,000
Total	154,000

Rail Rate Reductions

In connection with import and export rail rate reductions, details of which were published in Pacific Marine Review for August, the Western Pacific Railroad through T. Noel, foreign freight agent, has issued the following notice, dated August 12:

Proposed changes in import rail rates effective September 1. Tariff 30-G:

Rate basis 2 rates named in Tariff 30-G applying to Chicago and west will be amended so that they will also apply to Rate Basis 1 points, east of Chicago, on the following items: 325A, oils; 80, brooms; 106, cigars; 155, eggs; 250, hides; 335, palm kernels; 375, sage, tapioca; 415 skins and hides, rugs; 440, tallow; 460, tea dust; 501, wool, in grease; 40, antimony, metal or regulus; 85, bulbs; 135, copra; 175, fibre; 315, peanuts; 360, rattan; 405, silk waste, wild silk; 414, skins—sheet (dried); 455, tea; 480, toys; 502, wool, scoured.

Proposed changes in export rail rates effective September 1. Tariff 29-H:

Rate basis 2 rates, Chicago and west, named in Tariff 29-H, will be amended so that they will also apply from Rate Basis No. 1 points, east of Chicago, in the following items: 40, agricultural implements; 47, bottles; 45, canned goods; 60, chocolate; 65, dry goods; 70, glass; 75, glass; 85, road machinery; 87, ink; 150, lime; 155, machinery; 160, sewing machines; 172 motorcycles; 180, oil well supplies; 185, paint; 190, paper; 198, planes; 200, plumbers' goods; 205, railway equipment; 210, railway equipment; 220, railway equipment; 225, roofing; 235 rope; 240, soap; 255, starch; 260, heating apparatus; 265, tires; 270, tobacco; 275, tobacco; 280, vehicles; 285, vehicles; 290, vehicles; 292, vehicles; 315, all commodity.

Effect of Rail Reductions

The California Pacific Westbound Conference, through M. J. Mayfield, secretary, has compiled a comparison of through rates on various commodities as affected by the application of Rate Basis 2 to points east of Chicago, which will become effective September 1. This comparison discloses that of twenty-one principal commodities considered the advantage lies with New York in eleven and with San Francisco in ten. Generally speaking, the same condition would obtain if Seattle were set against Philadelphia.

In the following summary the amounts shown are the differentials a short ton enjoyed by New York or San Francisco on shipments originating in the interior cities named and destined to ports of the Far East. In order to ascertain the differentials, Mr. Mayfield added the rail and water rates of New York and San Francisco; the differences between the sums are the figures given:

Canned goods, Buffalo, San Francisco	\$11.71
Dry goods, Carolina cities, San Francisco	10.55
Plate glass, Pittsburgh, New York	7.60
Road machinery, Indianapolis, San Francisco	3.87
Road machinery, Cleveland, San Francisco	1.07
Acetate of lime, Bay City, San Francisco	7.50
Machinery, Indianapolis, San Francisco	1.07
Machinery, Cleveland, San Francisco	1.07
Sewing machines, South Bend, San Francisco	14.27
Paint, Cleveland, New York	1.00
Paper, Franklin, New York	4.45
Paper, Wachuset, N. Y.	4.25
Paper, Holyoke, New York	7.05
Paper, Hamilton, New York	2.05

Railway cars, Berwick New York	7.35
Soap, Cincinnati, S. F.	6.90
Automobile tires, Akron, New York	2.98
Cigars and plug tobacco, Richmond, S. F.	9.40
Unmanufactured tobacco, Richmond, New York.	19.70
Automobiles, Detroit, New York	26.06
Automobile chassis, Detroit, New York	17.72

That is, canned goods moving from Buffalo to Kobe could go over a transcontinental rail line through San Francisco and thence by water for \$11.71 a ton less than by rail to New York and thence by steamship; and so on. Any exporter of either coast may see at a glance whether he has any opportunity of commanding certain business.

Rail Rates Cut

The Southern Pacific has issued the following:

Announcement is made by G. W. Luce, freight traffic manager for the Southern Pacific Company, that the company will publish a rate of 75 cents per 100 pounds on imported copra, and vegetables, cocoanut and fish oils, both import and domestic, from the Pacific Coast to all Eastern territory, Cincinnati, Ohio, and west. This is the second reduction in these commodities since June 1. This adjustment represents a reduction of from 30 to 50 per cent less than the present rate and will be of material benefit to oil importers and copra-crushing firms located on the Pacific Coast. The rate will be made effective as soon as the concurrence of the lines east of Chicago and the Mississippi River to this adjustment is received. There is a large volume of these commodities moving through Pacific ports, but the importers were threatened with loss of the business on account of Canal competition. The rate announced by Luce is expected to keep the bulk of the movement moving through Pacific ports.

Important reductions in rates on smelter products from Arizona points and Cananea, Mexico, to Baltimore and New England points via New Orleans or Galveston in connection with the Southern Pacific-Atlantic Steamship Lines (Morgan Line) have been published to take effect September 12. The rate to New England points has been reduced from \$21.10 to \$17.60 per ton and to Baltimore the rate is reduced from \$20 to \$16.50 per ton. These reductions apply only on shipments forwarded via the Sunset-Gulf route.

Conference Disbanded

After a life that was stormy if short, the Seattle Pacific Westbound Conference was disbanded August 15 and its office was closed. After that

day there was no formal rate-making body in the Northwest. During the first few days following the dissolution, however, no rate-cutting was reported, although the situation had all the necessary potentialities of a tariff war. The Portland and California conferences remained unaffected, but they cast rather a dubious eye upon New York and the the North Atlantic-Far East Conference, which had not been enthusiastic about the Pacific Coast conferences for several months. Indications were, therefore, that trouble probably would arise in the Atlantic first, if it arose anywhere.

Fell Apart in May

As has been chronicled in these pages, the Pacific Westbound Conference fell apart in May, when the San Francisco committee disbanded. Although the latter was reorganized it refused to do more than work in harmony with the Northwest in rate-making, reserving to itself the right to fix its own tariffs. Seattle failed to persuade the San Francisco operators to return to the idea of one conference for the whole Pacific Coast; and Portland also fought vigorously against consolidation, with the result that Seattle was compelled to acquiesce in things as they were and to agree as best it might to the demands of the other cities. Pending formal reorganization of the Seattle body, the three conferences agreed to work together on transcontinental business and to advise one another of changes in local rates.

Several factors contributed to the first separation, but only one really was of compelling force. This was, to speak bluntly, the domination of the Canadian Pacific and Blue Funnel, which was manifested, according to the views of Portland and San Francisco, in several ways. For example, Portland operators asserted that the preponderating strength of Seattle lines in the old Pacific Westbound had resulted in the making of unfavorable rates on Portland's principal commodities, such as lumber, wheat and phosphate.

\$5000 Forfeit Plan

With three separate conferences in existence and each going its own way, Seattle decided to apply to itself a proposal it had urged on San Francisco, which was that each member company post a bond of \$5000 to guarantee compliance with tariffs and rules of the organization. All members agreed to do this except for Mitsui and the Blue Funnel, which agreed to abide by rates but stated that they would be compelled to refer the posting of a forfeit to

their home offices. Weeks passed and nothing was done by either concern, and, of course, the others did not wish to post their own forfeits in the meantime. As a result, the conference became more disorganized, and finally broke to pieces.

New York the Danger

In some quarters the belief was expressed that there would be no rate-cutting until October, at least, inasmuch as most of the goods moving to the Orient had been contracted for up to that month. After that, however, something might occur. But New York is the real danger. During the many troubles of the Pacific Westbound Conference, the North Atlantic-Far East organization has become more restive and recently said baldly to the Pacific Coast that any more trouble would be the signal for independent action; in other words, that the Pacific need expect no working arrangement. In the old days of the Pacific Coast Oriental Tariff Bureau and the Pacific Westbound Conference the two coasts had kept in touch with each other through a New York committee of the Pacific, which had had practical control over all trans-Pacific rates on freight originating in the East, these tariffs being based on the ruling North Atlantic rates and those of transcontinental railroads, so that one coast would not be cutting under the other. But with the Northern lines out of all conferences there exists little prospect of the Atlantic being willing to work with San Francisco and Portland alone. Unrestricted competition for freight originating in Atlantic territory, therefore, is impending.

In addition to this situation, there are other disquieting aspects. One is the subject of rumors to the effect that the Shipping Board is tiring of the maneuvers of foreign lines and that it is preparing to fight, with rates as low as \$2 a ton in prospect. At the present time, that is no more than a rumor.

Australasian Conference Formed

Formal organization of the Pacific Coast-Australasian Freight Tariff Bureau was completed at a meeting of companies in the San Francisco offices of the Shipping Board July 26. That such an organization was being made had been stated previously in these pages. The member companies and their representatives were: Union Steamship Company of New Zealand, Messrs. Back and King; Oceanic Steamship Company, Graham; General Steamship Corporation, Chidester and Wintermute; Yamashita Kisen Kaisha, Hitching; Ca-

nadian Government Merchant Marine and Canadian-Australasian Royal Mail Line (Union), J. C. Irons of the latter. This conference will exercise control over all rates from the Pacific Coast of the United States and Canada to New Zealand and Australia, which heretofore have been governed only by informal understandings between the lines concerned.

Headquarters of the Pacific Coast-Australasian Freight Tariff Bureau will be maintained in San Francisco, with J. H. Todd, Shipping Board conference secretary, as secretary. No offices will be maintained elsewhere on the Pacific Coast, the plan of the conference being that all Northern votes shall be transmitted by telegraph.

Several rate changes were made at the organization meeting. In these times of declining rates it is rather unusual to hear of an increase being made, but the new conference stepped out boldly and raised lumber from a flat rate of \$20 to \$21 to Melbourne and \$22 to Adelaide. New Zealand ports and Sydney remain unchanged at \$20. Indirectly dullness of business, however, made the increase possible, because the inability of sailing vessels to obtain return cargoes of coal at Newcastle makes the downward voyage in lumber unprofitable and consequently leaves the field to steamships. The latter had regarded the \$20 flat rate as too low.

Among the other new rates announced were: sulphate of ammonia, \$10; beans, \$15 instead of \$20; canned salmon, \$16 instead of \$18; doors, \$15 instead of \$17.50; inside finishing, \$15 instead of \$17.50; piano lumber, \$15 instead of \$20, weight or measurement; quicksilver, \$1.50 a flask of 80 pounds; rice in parcels, \$15; in lots of 100 tons or more, \$12; strawboard, \$10 instead of \$15; wallboard, \$12 instead of \$15; machinery, overland, not more than 5000 pounds to the piece, \$15, weight or measurement; more than 5000 pounds, \$5 a ton less than the rate for pieces of corresponding weight as shown in the local tariff. These rates constitute a reduction of \$5 on pieces exceeding 5000 pounds, which formerly took the local rate.

Steel Rate Broken

Under pressure of the North Atlantic-Far East steel rate of \$13 a long ton, equivalent to \$11.61 a short ton, the trans-Pacific tariff has broken from \$5.88 to \$5, the reduction being made effective by the California Pacific Westbound Conference

July 20. This new rate comes dangerously close to the actual cost of transportation.

Steel was not the only rate to break. Several changes were made, the most important of which were: copper from \$10 to \$8 weight; condensed milk from \$12 weight or measurement to \$10 weight; paper NOS from \$14 weight or measurement to \$12.50 weight; and rates were set on lead and lead spelter, \$8 weight; plaster board, \$8 weight or measurement; cotton moved contrary to the downward tendency, being advanced from \$8, standard or high density, to \$10 weight.

Oriental Experience

Lindgren & Marr, commission merchants and importers and exporters, who organized their firm the first of the year, and who have established their quarters in the new Balfour building, San Francisco, have had much personal experience in the Orient, which should be valuable to American companies seeking to do business with the Far East.

J. L. Marr has had a wide experience in foreign trade, having been actively engaged in it for eight years. During three years of that time he was manager of the Kobe office of Hind, Rolph & Company, and later was manager of the Hind-Rolph foreign department in San Francisco, which position he left to organize the new company.

Charles J. Lindgren, the senior member, also has had experience in the Orient, where he was a member of the staff of the United States Shipping Board under J. A. McGregor. Campbell McGregor, the third member of the firm, also was in the Orient and was for six years with the Union Iron Works, San Francisco, of which his father, J. A. McGregor, was president.

Page Freight Report

San Francisco, August 24, 1921.

Since July 13, when our last circular was issued, business in chartering has continued very active, especially in barley charters on account of the drought in the United Kingdom. Steamers Keats and Shelly were chartered at 65/- for wheat from Portland and the steamer Wiron at the same rate by the Northern Grain Warehouse Company. The steamer Vancouver by the Portland Flouring Mills at 63/9; the Cape Ortogal from Portland, also at 65/-, chartered by Balfour, Guthrie & Company, and the steamer Montrose by M. H. Houser at 65/-. The Amer-

ican steamer Nashaba chartered at 65/- for one port, 67/6 two ports from Portland, though the charterers' names are not yet given. The steamer Rubens from Columbia River to United Kingdom, etc., at 65/- for wheat by the Northern Grain Warehouse Company and the steamer Benrines chartered some time previously to United Kingdom at 60/-.

From San Francisco, Strauss & Company chartered steamer Grelisle for barley to the United Kingdom at 65/- for one port, 67/6 two ports; steamer Janelew at the same rate; also steamer Tancred at 65/- for one port and steamer Jose de Larinagua at 65/-; steamer Anglesea at 65/- for one port, 66/3 for two ports. U. S. S. B. steamer Narbo 65/- one port, 67/6 two ports. John Westrope & Company chartered the U. S. S. B. steamer Narcissus for barley to the United Kingdom at 65/- one port, 67/6 two ports; also Japanese steamer Koki Maru, same destination, same freight. Balfour, Guthrie & Company chartered U. S. S. B. steamer West Cusseta at 65/- and 67/6, and George Wills & Sons another U. S. S. B. steamer, as yet unnamed, at the same rate of freight, and all the different shippers took everything in sight on the regular liners for different United Kingdom or Continental ports at 65/-. In one case as high as 67/6 was paid for a thousand to two thousand tons to Avonmouth.

Chartering for lumber has not been as active as grain. A. F. Thane & Company chartered schooner W. A. West from the North to Callao at \$18 a thousand and yesterday the Port Blakely Mill Company chartered the schooner William Nottingham from Puget Sound to Callao at \$17.50. J. J. Moore & Company apparently have been the only charterers of lumber vessels to Australia, they having chartered the motorboat Malahat and the schooners Annie M. Campbell and the North Bend to Sydney, Melbourne and Adelaide on private terms. They also chartered the steamer Iquitos to three ports of discharge in Australia at a reported value of \$17.50 and schooner Retreat to Adelaide at \$16. In miscellaneous charters we have that of the steamer Romulus from Peru to Vancouver with a cargo of sugar at \$9 and the American steamer Delco from the North Pacific to New York with a capacity of about two and a half million feet chartered by the Willapa Lumber Company at \$18 a thousand.

As we close, the grain market

seems to be inactive in England, with a result that steamers are now willing to accept 60/- to the United Kingdom and Continent.

PAGE BROTHERS, Brokers.

Beyfuss Freight Report

San Francisco, August 25, 1921.

During the past six weeks the freight market in general has shown no more activity than it has for a while past, although the inquiries are more numerous, where there was a dearth of inquiries before. Little actual business in a large way has been done except in grain exporting.

Rates in this trade have been ruling on a basis of 65 shillings for wheat from North Pacific to one port U. K., usual continent range, and quite a number of steamers have been taken for prompt and forward loading. These reported fixtures have been practically all British steamers, although two Norwegian and two Japanese have also been closed and half a dozen Shipping Board carriers.

The Shipping Board rate has been 65 shillings wheat and/or flour and/or barley and its vessels were fixed for prompt loading.

During the past week there has been a softening in grain freights and several foreign steamers are now reported fixed for wheat at 60 shillings, September/October loading from North Pacific to U. K. or Continent.

Lumber freights are still quite unremunerative from owners' standpoint, but three or four full sailing cargoes are reported to W. C. S. A. and Australia, \$18 being nominally the rate for the first named ports; and \$17 has been about the prevailing rate to Australia.

As we remarked above the general tendency shows more activity, but the importation of coals, copra and nitrate has been practically at a standstill.

C. BEYFUSS CO., Brokers.

Loss Record

According to the Liverpool Underwriters' Association, the number and total gross tonnage of vessels lost during June, 1919, 1920 and 1921, are as follows:

	No. Vessels	Gross Tonnage
June, 1921	18	35,925
June, 1920	14	29,666
June, 1919	12	17,494

Comparative figures of total losses for May are:

	No. Vessels	Gross Tonnage
May, 1921	13	27,659
May, 1920	26	51,632
May, 1919	15	23,178

About People

Joseph W. Powell, former president of the Fore River Shipbuilding Corporation and former vice-president of the Bethlehem Shipbuilding Corporation, will undertake the reorganization of certain departments of the Emergency Fleet Corporation, according to announcement made in Washington by Chairman Lasker of the Shipping Board. In commenting upon this announcement, Mr. Powell said that, contrary to impressions gained in many quarters, he had not been appointed a member of the Shipping Board. In fact, he had declined an invitation to become vice-president and general manager. What Mr. Powell has specifically consented to do is to give his services to the Shipping Board for a period of three months, without salary, on the distinct understanding that he is to have absolute authority to handle certain matters placed in his charge. These matters are the reorganization of the financial, auditing and sales departments, the last including sales of ships and shipyards. At the end of the three months' period he will be occupied with personal business matters that he had undertaken some months ago. Mr. Powell said that he accepted the responsibility only out of a sense of duty and to place what ability and experience he had at the service of the American merchant marine.

G. C. Williams, Sacramento steamer agent for the Southern Pacific Company's steamer division since August, 1912, has been appointed assistant superintendent of steamers for the Southern Pacific Company, succeeding F. A. Fish, who retired on July 30 after forty-five years' service.

Captain John Park has been appointed a pilot of Vancouver, B. C.

George B. Dunlap, for ten years contracting freight agent of the Great Northern Railroad in Seattle, has joined the Puget Sound office of the Atlantic-Gulf & Pacific.

D. Earle Brundage of Chicago has been appointed advertising director for the Shipping Board to succeed Herman Laue. Mr. Brundage will make a survey of the advertising situation before the adoption of a new policy by the board.

E. F. Townsend, agent of the Pacific Steamship Company at Singapore, has been transferred to Kobe, succeeding Ernest E. Johnson, resigned. **H. M. Cavender**, formerly chief clerk of the Kobe office, has been appointed assistant to J. B. Armstrong, agent at Manila.

George H. Kocherspeger has been

elected chairman of the Delaware River Section of the Atlantic Coast Shipbuilders' Association for the coming year. **J. K. Graham** is vice-chairman and **Clarence Samuel King** secretary.

Admiral Benson has been delegated to represent the Shipping Board in conferences with private operators on labor relations. Other pending questions will be handled by commissioners as follows: Benson, sale of ships to foreigners; Plummer, advances of funds to operators; O'Connor, labor problems; Benson, allocation of ships; Plummer, value of wooden vessels; Benson, co-operation between the Shipping Board and the State Department; Plummer, relations with Interstate Commerce Commission; Lissner, insurance matters; Thompson, all claims other than those for construction; Chamberlain, relations with War Department.

William H. Collins, former assistant of hull construction, Harlan plant, Bethlehem Shipbuilding Corporation, has been appointed superintendent of hull construction. **William A. Quade**, former general foreman of the machine shop, has been made superintendent of machinery.

Captain Randall Rogers has been appointed master of the Los Angeles Steamship Company's Harvard, recently placed in the Los Angeles-San Francisco service. **F. C. Delleger** is chief officer; **Walter Madler**, second officer; **F. W. Muller**, third officer, and **L. J. Weld**, fourth officer. **Herman Broghman** is chief engineer and **Walter Nagel** assistant engineer.

Captain Frank Mills, former master of the steamship Editor, has taken command of the West Canon, operated by Struthers & Dixon in the Puget Sound-Oriental service.

Commander H. C. Dinger, U. S. N., has been detached from his duties as inspector of machinery at the Fore River plant, Bethlehem Shipbuilding Corporation. He went to Fore River in 1918 as assistant to Rear Admiral McElroy and in 1919, when the admiral was detached for other service, he assumed the duties of inspector of machinery. He has been succeeded by **Commander Carlos Bean**, formerly at Cramp's.

Lieutenant C. D. Bishop, U. S. N., who has been assistant to Commander Jordan, U. S. N., supervising cost inspector at the Fore River plant since December, 1920, assumed duties on July 1 as cost inspector, while **Commander Jordan** has sailed on the Utah for a foreign station.

George E. Chapin, formerly of the claims department, Toyo Kisen Kaisha, San Francisco, has been made general freight agent.

Captain John Moreno, port captain of the Pacific Mail, San Francisco, has relieved **Captain R. R. Drummond** as master of the steamer Venezuela.

Edmund L. Woods, secretary of the Board of Marine Underwriters, San Francisco, sailed on the Royal Mail Steam Packet motorship Somersetshire for England August 19.

E. C. Rogers, guarantee engineer of the Newport News Shipbuilding & Drydock Company, who made a voyage from Baltimore to San Francisco on the 535 Golden State, fell while leaving the Hawkeye State a few days after his arrival and fractured his leg.

H. B. Taylor, vice-president of William Cramp & Sons Ship & Engine Building Company, Philadelphia, visited the Pacific Coast in August.

Kent Clark, manager of the Toyo Kisen Kaisha's Oriental Hotel, Kobe, arrived in San Francisco on the steamship Shinyo Maru in August. Mr. Clark formerly was purser of the Pacific Mail Manchuria and the China Mail China.

George A. Armes, president of the Moore Shipbuilding Company, Oakland, returned home in August from a trip to Washington, on which he wound up unsettled business between his company and the Shipping Board.

Prince Axel of Denmark, cousin of King Christian and of King George of Great Britain, had command of the East Asiatic motorship Asia when she arrived at Pacific ports in August. The prince is an officer of the Danish navy.

Captain Isaac Turppa, master of the tug Portland of the Port of Portland, has been appointed a Columbia River pilot. The number of pilots has thus been increased to twelve.

Henry C. Wiltbank has been appointed secretary of the National Merchant Marine Association, effective September 1. Mr. Wiltbank is well known to the marine world through his connection with the Philadelphia Press, New York Sun and New York Journal of Commerce, and more recently as shipping editor of the New York Tribune and editor of the Marine Journal. He also has been associated with the Atlantic Coast Shipbuilders' Association and the Committee of American Shipbuilders.

Morris Malkin of New York has been appointed manager of the chartering department of the Shipping Board.

John K. Caldwell, United States consul at Kobe, has been made Japanese secretary of the embassy to Tokyo, succeeding J. W. Ballantine, who becomes consul at Dairen. M. D. Kiriansoff, Dairen consul, goes to Kobe temporarily.

H. S. McKee, Jr., has been elected secretary of an organization to be known as the Los Angeles Steamship Agents' Association, recently formed at a meeting called by W. S. McPherson. Uniformity of practice will be one of the ends sought.

J. Harry Mull, president and general manager of the William Cramp & Sons Ship & Engine Building Company, Philadelphia, was elected treasurer of the Atlantic Coast Shipbuilders' Association to succeed Sidney Henry, resigned, at the monthly meeting of the administrative council of the association in Philadelphia August 8.

R. J. Ringwood of San Francisco has been appointed manager of the operating department of the Shipping Board, succeeding L. R. Rutter. Mr. Ringwood entered the employ of the Pacific Coast Steamship Company in 1899; went from that line to the Alaska Pacific Steamship Company as freight and passenger agent at Seattle; was traffic manager at Seattle and San Francisco from 1910 to 1916; became vice-president in the latter year and resigned the next. He was with Pacific Motorship and Pacific Freighters recently.

William J. Rogers, chief engineer of the U. S. S. B. Hawkeye State, operated by the Matson Line, was found guilty of incompetence and negligence in connection with that vessel's recent boiler trouble and was suspended after a trial before Inspectors Dolan and Turner, San Francisco. Other engineers were punished as follows: W. F. C. Davis, first assistant, suspension of license for three months; Berry Sturgeon, second assistant, one year; and Carl Hummel, third assistant, three months.

William O. Dunlevy, second assistant engineer of the U. S. S. B. Creole State, disabled on her latest trans-Pacific voyage, was accused on the liner's return to San Francisco of having instigated George Wing, an oiler, to place emery dust in the oil pumps. These men and one other were returned from Manila under arrest.

John T. Bloomer, formerly traffic manager of the Rolph Mail Steamship Company, has been appointed traffic manager of R. S. Silva & Company, general Pacific Coast agents of the Lindvig interests, which re-

cently announced their reentry into the Pacific West Coast trade.

A. F. Mack has been appointed district manager, Shipping Board, New York, succeeding George W. Sterling. His jurisdiction will include New York, Philadelphia and Boston, although later he will have the entire Atlantic Coast, it is stated in Washington.

M. F. Cropley, assistant manager of the Pacific Steamship Company, in charge of San Francisco business, has been appointed manager of the Oregon district. This position is new. The late Frank J. O'Connor was agent at Portland.

In Eastern Insurance Circles

Hendon Chubb and Percy Chubb, of Chubb & Son, are making an extended business trip in Europe.

Ery Kehaya, president of the Washington Marine Insurance Company, is in Europe looking after the reinsurance accounts of his company.

Walter Wood Parsons, vice-president of the Atlantic Mutual Insurance Company, is another European sojourner.

Cecil B. Stewart is once more in active control of the brokerage firm of Frank B. Hall & Company.

H. C. Landwehr, treasurer and director of Frank B. Hall & Company, resigned August 1.

Frank H. Gasson has resigned as manager of the claims department of the United States marine branch of the Second Russian.

Eugene J. Coleman and Robert B. Jennings, underwriter and loss manager respectively in the firm of William H. McGee & Company, have resigned to open a marine office on their own account. The McGee office, which is one of New York's leaders, will continue the business as William H. McGee & Company. This was one of the most startling changes that Beaver Street has had in some while, both retiring gentlemen being members of the firm.

Deaths

Captain Thomas H. Peterson, retired mariner, in Seattle July 28.

Captain Ole Nielsen, in Coos Bay, Oregon, July 27.

Captain Harry H. Marden, the Puget Sound pilot who had charge of the steamship Governor when she was rammed and sunk by the West Hartland April 1, in Seattle July 20. The Governor disaster had much to do with his breakdown and death.

Captain J. S. Hellingsen, port captain of Hind, Rolph & Company, San Francisco, in San Francisco July 19.

Captain Harry Thellisen, who commanded the first Yukon River steamer to reach Alaska in 1898, was found dead at the bottom of the shaft of his coal mine in the Kobuk district, Alaska, July 24.

Captain Troels Smith, a well-known Pacific Coast mariner, in Mare Island Naval Hospital July 26.

Rear Admiral George Fink Katz, U. S. N., retired, in San Francisco August 9, at the age of 86.

Captain John L. Carlson, formerly a navigator in the coastwise trade, president of John L. Carlson & Company, salmon packers of Alaska, in Juneau, August 9.

Riga Reorganization

Trade Commissioner H. Lawrence Groves of Riga reports as follows to the Department of Commerce:

Through a complete reorganization effected on May 20, 1921, the former Second Riga Mutual Fire Insurance Company, originally organized in 1804, has now become the Riga Insurance Company, with a reported share capital of 5,000,000 German marks and a reserve fund of approximately 500,000 German marks, the latter represented partly by the company's home office building, Grosser Sandstrasse, 20, Riga.

The new company will underwrite all common forms of risk except life insurance, its undertakings being in charge of the three Riga firms, R. John Hafferberg, Wittrock & Schleicher, and the shipping firm of Helmsing & Grimm, which will handle its transport insurance. The reinsurance business of the company will be in the hands of the Munich Reinsurance Company (German), which has participated in the reorganization.

Bids Asked for Insurance

The Japan Advertiser publishes the following:

In tiding over the present shipping depression, it is important for shipowners to reduce their working expenses. They have already lowered wages as much as possible, and some of them are now trying to cut down insurance premiums. A certain shipowner in Nishinomiya invited tenders for the insurance of a ship of 8462 tons deadweight, built in 1916. The lowest rate was quoted by a certain marine insurance company in Osaka, with which the contract has been signed. It is said that the new rate is appreciably lower than that hitherto charged. This is the first time in the annals of marine business in Japan that a marine insurance contract for a ship has been made by public tender.

PACIFIC MACHINERY

LARGE OXYACETYLENE GAS PLANT

EARLY in 1919 the Los Angeles Shipbuilding and Dry Dock Company installed in its shipyard on Los Angeles harbor the largest complete plant for generating oxygen and acetylene in Southern California. This plant consists of a cell house containing 200 Levin electrolytic cells supplied by the Electrolabs Company of Pittsburgh, having an hourly capacity of 1000 cubic feet of oxygen, and an acetylene generating plant with an hourly capacity of 2000 cubic feet of acetylene gas, together with suitable gasometers and oxygen high pressure tanks.

The acetylene plant was put into commission in March, 1919, but the oxygen plant on account of delay due to causes beyond the control of the shipbuilding company, was not ready for operation until late in July, 1920. The whole yard and shops were piped with mains so as to bring the gases under suitable



Exterior view of the oxyacetylene generating plant at the Los Angeles Shipbuilding & Dry Dock Company

pressure to all points where they might be needed for cutting and welding operations.

At the time that these plants

were decided upon, Mr. H. Haas, a research engineer, was brought to the yard to carry on a campaign of education and training among the welders and cutters and to have complete charge of the erection and operation of the generating plants. Due to a careful supervision and training of the workmen and the weeding out of inefficients, the acetylene consumption at the yard dropped in 1919 from 6,023,900 cubic feet to 1,911,291 cubic feet, while oxygen consumption dropped from 10,192,000 cubic feet to 3,778,060. In 1920, due probably to the installation of the drydock and the taking on of a large amount of repair work, the consumption of oxygen rose again to 6,194,756 cubic feet, of which 2,787,616 cubic feet was of the firm's own manufacture, the oxygen plant having begun operation late in July, 1920.

The company and their research engineer, while of the opinion that great economies have been effected in the yard through the manufacture of gas in their own plants and distribution through pipes to the various yard stations, still figure that the leakage space in the high pressure oxygen can be further reduced. It is always noteworthy in surveys of plants such as these that the acetylene leakage is very small.



Interior view showing the control switchboard and the motor-driven compressor and part of one generating set

In this plant it does not exceed one per cent. This is due to two facts: first, the low pressure at which acetylene is carried; second, the fact that the unpleasant odor of acetylene makes detection of leaks an easy matter. Oxygen, on the other hand, being an odorless gas and carried at much higher pressure, has a much larger proportion of leakage.

Detection of Leaks

The Los Angeles Shipbuilding and Dry Dock Company has now under

consideration the idea of imparting a stench to oxygen gas which, while in itself harmless, will give a very decided warning of any leak in the pipe lines. This is not a new idea, some European cities having carried out the practice in installations of poisonous gases, like water gas or natural gas, with considerable success.

The cost of handling the heavy cylinders in which acetylene and oxygen gas are supplied was no

small factor in determining the installation of this gas generating plant and of the piping throughout the yards. In 1918 the Los Angeles Shipbuilding and Dry Dock Company had used 50,960 oxygen cylinders and 20,772 acetylene cylinders.

It will be readily seen that the handling of this number of cylinders inside the yard itself would be no small problem and would constitute a very considerable item of expense.

UNIVERSAL VALVE FACING MACHINE

THERE has been a great demand in machine shops and garages for a portable machine tool for dressing the face of poppet valves such as are used in many types of pumps, in internal combustion engines, and in some forms of steam engines. We believe that this demand has been met by the Universal valve facing machine now being introduced to Pacific Coast markets by Harron, Rickard & McCone, San Francisco.

This machine consists of a grinding wheel and a spindle with a special Universal self-centering chuck which holds the valve stem at the correct angle for grinding the face of the valve.

The machine is portable and can be placed on the repair bench.

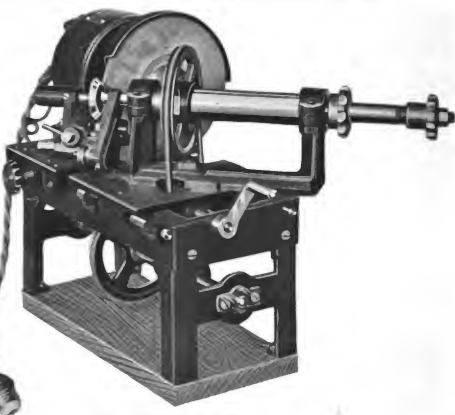
It is driven by a 110-volt induction motor using alternating current and having a rated speed of 3400 r. p. m.

The machine is furnished complete with 6 feet of lamp cord and plugs ready to attach to a lamp socket.

The abrasive wheel is mounted on the motor shaft, and the valve to be ground is held in a spindle which is driven from the motor through a reduction gearing and belt. This spindle is adjustable to any angle desired for the valve face.

One of the special features which makes the Universal valve facing machine desirable is the self-centering chuck. This chuck grips the end of the valve stem by the twist of a knurled knob. It is adjustable for any length of stem up to 7½ inches. The head of the valve is run on a center point or in an adjustable double-V steady rest. If the center mark on the head of the valve is true, the center point is used. If the stem near the head is true, the rest is used.

The capacity of the machine in-



Universal valve facing machine

cludes all valves up to 3 inches in diameter with stems from 5/16 to 7/16 inch diameter and up to 7½

inches long. A valve may be faced absolutely true with this machine in less than one minute.

Centrifugal Castings

A NEW development in foundry practice is the centrifugal method of casting which has been applied successfully in recent months to the production of iron, steel and nonferrous drums and cylinders.

The method consists of pouring the molten metal directly into a revolving die or form, and has resulted in producing castings with physical properties very much superior to those obtained with similar mixtures of metal by casting in the ordinary sand mold.

At Stokes Castings, Ltd., of Mansfield, England, they have now an average output of 2000 castings per week, largely piston ring drums and cylinder liners for internal combustion engines. This company has carried on a long series of experiments on mixtures, pouring temperatures, die temperatures, revolving speeds, etc., and they have been able to systematize their work with this method of casting so that in their latest machines, which are driven directly by a variable speed motor through a flexible coupling and friction clutch.

RECLAIMING WASTE

STRICTEST economy is necessary at the present time in all machine shops, and it will therefore be of interest to American shop operators to read the following description of the waste reclaiming plant of the Canadian National Railways at the Leaside shops, Toronto, taken from the Canadian Railway and Marine World. The waste here referred to is that used in the journals of railway cars, but the method of reclaiming is applicable to waste used for almost any purpose in our machine shops.

When the old waste is brought into the reclaiming plant, it is placed on grating, picked over, and separated into two portions, according to quality, the better grade being used subsequently for passenger car journal lubrication and the other for freight cars. The short ends, waste filled with babbit, etc., go through the grating into a receptacle provided to receive them. The old waste is then placed in a tank. This is so constructed that the interior tank is surrounded by a jacket on the bottom and sides. The tank is of wood, the lining and jacket material being sheet iron.

Two pipes open into this jacket,

or outer tank, one of which conveys cold water, forced in by a pump, and the other conveys live steam. The water level is shown by a water glass. A pipe conveying compressed air opens into the interior tank, connecting to a series of pipes at the bottom of the tank, each of which has openings along its upper surface. On top of this layer of pipes is a $\frac{1}{4}$ -inch mesh screen, to keep the waste from coming into direct contact with the air pipes.

The interior tank contains oil, to which a certain amount must be added every time the reclaiming operation is performed. When the picked over old waste is put in, the cover is put down and secured and the air pressure applied. This agitates the mass of oil and waste, while the live steam entering the water in the outer jacket keeps it hot. This agitation goes on for from two to five hours when the air and steam are shut off, the waste taken from the tank and placed in the cylindrical compressor above the tank, where it is subjected to a pressure of 80 pounds a square inch, the oil draining back into the tank.

Following this operation the waste is again put on a grating and picked

over to loosen it; it is then soaked in oil for five hour, after which it goes to the next tank and drains for six hours; then it is stored in tanks, all ready for use in the journal boxes. The drainage tanks for this last operation are so arranged that the oil can be easily drawn off and any sediment removed, and the oil can be used over and over again with a very small addition each time.

In connection with the oil used in the first operation, where the waste was subjected to the agitating action of the air jets, there are tanks, divided into three compartments, in which the oil is afterwards placed. Oil from the first compartment overflows into the second, and from the second into the third. Practically all of the sediment is drawn out of the first compartment, a little out of the second, and oil in condition to be used for a repetition of the operation is drawn from the third.

Waste which is not fit for further use in journal boxes is burned in an incinerator and the babbit reclaimed. At the C. N. R. Leaside shops, the reclaiming plant handles the packing from approximately 4000 journal boxes a month.

OXYACETYLENE VERSUS DYNAMITE

SIX twelve-inch mortar carriages, part of the fortifications protecting Long Island Sound, are being removed from their positions of dignity at Fort Wright, Fishers Island, to the less glorious confines of a scrap yard at New London, Connecticut.

"Finis" was written officially to their service last spring when the carriages were sold by the government as scrap. The guns originally mounted on the carriages were remodeled for use with mobile artillery during the war.

The task of removing the scrap material is no easy one. Many of the sections are heavy and cumbersome. The purchaser has attempted to reduce the castings to portable size by blasting with dynamite. Blasting, however, has not proved satisfactory owing to the labor and time involved in moving the unwieldy metal from the concrete battery positions to open fields nearby, the danger of flying fragments hitting passing soldiers, and the inability of the charge to fracture the steel sections easily.

The difficulties experienced with dynamite led the purchaser to investigate the possibilities of the oxyacetylene flame in cutting metals, especially cast iron.

Demonstrations were made by an expert cutter of the Aircro Engineer-



Aircro oxyacetylene operator cutting 12-inch mortar carriage at Fort Wright, Fishers Island

ing Service Department. These were so successful that it is expected the use of dynamite will be discontinued,

and the oxyacetylene torch utilized to cut up the balance of the metal.

PORTLAND'S TRAFFIC DEPARTMENT



H. L. Hudson, general traffic manager for the Port of Portland

WITHIN the past ten years the Port of Portland Commission and the Commission of Public Docks of Portland have expended upon the municipal improvements, harbor and channel improvements, and cargo handling facilities of that port, over \$14,000,000. These bodies at the time of the beginning of the present depression in shipping realized that it was necessary to sell to the marine shipping world the advantages of Portland as a seaport in order that they might justify to the people of Portland this heavy investment in port improvements.

With this thought in mind in April, 1920, the commissioners secured the services of Harry L. Hudson as general traffic manager, and the results obtained to date indicate that the commissioners picked the right man to sell the facilities of the port. The whole of Mr. Hudson's experience has been closely related to traffic, either by railroad or steamship. He began as a messenger boy with the M. K. & T. Railway at Parsons, Kansas, and worked up through the various departments of the Union Pacific system until he was in active charge during 1917 of the operating and traffic department of that system in the Puget Sound territory, at the same time acting as dock agent of the Union Pacific dock at Seattle.

In all matters pertaining to marine traffic, rates, regulations, customs duties, negotiable documents, and trade exchanges, Mr. Hudson is recognized as an expert. This wide expert experience, taken together with a winning personality and an enormous capacity for work, has enabled Mr. Hudson to achieve great results already in his work for Portland.

He has established an efficient organization in his department, has opened branches in Japan and on the Atlantic seaboard, and is at the present time in negotiation with representatives for Portland in South America, Australia, and New Zealand.

The foreign traffic agent under Mr. Hudson is Mr. W. G. Tait, who has headquarters at Kobe, Japan. Mr. Tait has had a very considerable experience in railway traffic and during the war in traffic management for the United States Shipping Board at Seattle. After the armistice he was placed at Shanghai as manager for the Shippers' Commercial Corporation.

The New York office of the traffic department is in charge of C. A. Lockhart, who has had a large experience in the employ of the Canadian Pacific Steamship Company, both in Canadian and Oriental ports.

The traffic department has recently established a publicity bureau, whose activities will cover the publication of booklets, maps and other illustrated literature concerning the navigation of the Columbia River and the facilities of the Port of Portland. This bureau has been placed in charge of Robert Miles Standish, an experienced publicity



R. M. Standish, manager publicity bureau of the Port of Portland

expert. Mr. Standish has large plans under way for obtaining moving picture publicity for the Port of Portland.



The two Sir Toms. A photograph taken on the New York waterfront of Sir Thomas Lipton, Bart., and Tir Thomas Lipton, Schr. This schooner, together with a sister ship, is owned by William U. Taylor, admiralty lawyer of New York. They are at present in the Columbia River lumber trade under the management of the Columbia Pacific Shipping Company.

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Pacific
Marine Review
The National Magazine of Shipping



U.S.S. CALIFORNIA.
AT PEARL HARBOR DRY-DOCK.
SEPTEMBER 1921.

OCTOBER

21





Behind the locomotive

FEW people realize the enormous work done by Linde in keeping the wheels turning on our railroads.

The recent National transportation tangle would have been a thousand times worse but for the quick and permanent repairs on rolling stock and rails made possible by the oxy-acetylene process.

Linde Oxygen, because of constantly uniform purity and unfailing deliveries,

is an important work
on roads of standing.

Whenever time is a weighty factor in repair work Linde Oxygen and Linde Service are indispensable.

Seventy-five plants and warehouses centrally situated, place Linde quality and Linde Service at the disposal of every oxygen user.

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Carbide and Carbon Building, 30 East 42nd Street, New York
Balfour Building, San Francisco

THE LARGEST PRODUCER OF OXYGEN IN THE WORLD

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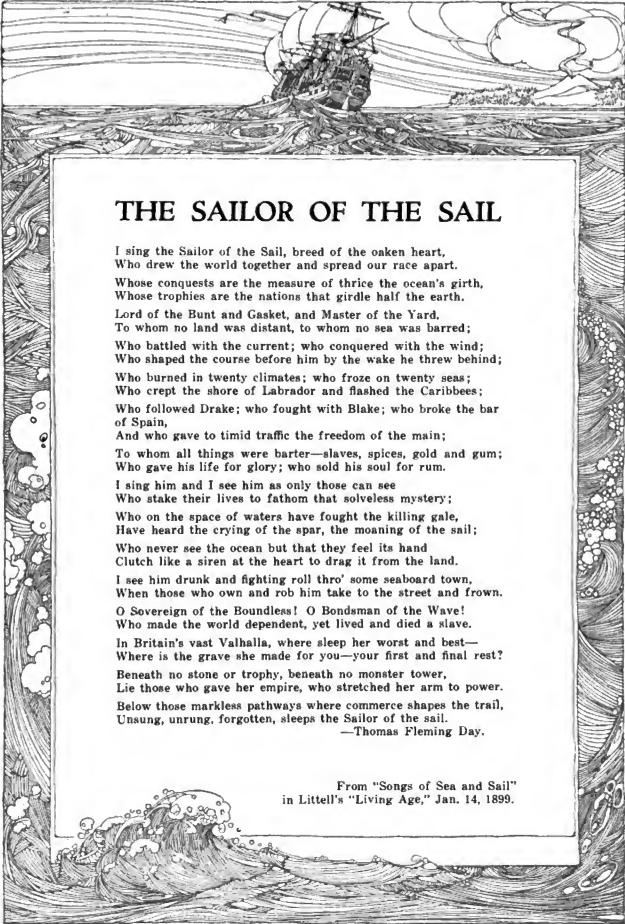


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THE SAILOR OF THE SAIL

I sing the Sailor of the Sail, breed of the oaken heart,
Who drew the world together and spread our race apart.
Whose conquests are the measure of thrice the ocean's girth,
Whose trophies are the nations that girdle half the earth.
Lord of the Bunt and Gasket, and Master of the Yard,
To whom no land was distant, to whom no sea was barred;
Who battled with the current; who conquered with the wind;
Who shaped the course before him by the wake he threw behind;
Who burned in twenty climates; who froze on twenty seas;
Who crept the shore of Labrador and flashed the Caribbees;
Who followed Drake; who fought with Blake; who broke the bar
of Spain,
And who gave to timid traffic the freedom of the main;
To whom all things were barter—slaves, spices, gold and gum;
Who gave his life for glory; who sold his soul for rum.
I sing him and I see him as only those can see
Who stake their lives to fathom that solveless mystery;
Who on the space of waters have fought the killing gale,
Have heard the crying of the spar, the moaning of the sail;
Who never see the ocean but that they feel its hand
Clutch like a siren at the heart to drag it from the land.
I see him drunk and fighting roll thro' some seaboard town,
When those who own and rob him take to the street and frown.
O Sovereign of the Boundless! O Bondsman of the Wave!
Who made the world dependent, yet lived and died a slave.
In Britain's vast Valhalla, where sleep her worst and best—
Where is the grave she made for you—your first and final rest?
Beneath no stone or trophy, beneath no monster tower,
Lie those who gave her empire, who stretched her arm to power.
Below those markless pathways where commerce shapes the trail,
Unsung, unrun, forgotten, sleeps the Sailor of the sail.
—Thomas Fleming Day.

From "Songs of Sea and Sail"
in Littell's "Living Age," Jan. 14, 1899.



A STAUNCH OLD WINDJAMMER

THE six-masted barkentine E. R. Sterling, photographed just after a tug had cast off at the San Francisco lightship. She is a vessel of 2404 tons gross, 308 feet in length and 42-9 beam. She was built by Harland & Wolff, Belfast, in 1883, and is, as the date of her build would indicate, of iron. She was formerly the Lord Wolseley; then the German ship Columbia; then the Lord Wolseley again, after she had been wrecked and repaired; under the latter name she was towed into Victoria disabled and was repaired on the American side, thus gaining American registry. Her name was again changed, this time to Everett G. Griggs, and finally to E. R. Sterling. She is one of the few sailing vessels of the world equipped with wireless.

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PACIFIC COAST FISHERIES

California, the Premier Fishing State—II.

THE first installment of this article covered the story of California's fisheries in a general historical way and gave considerable data on the boats, apparatus and personnel, particularly of the fisheries from San Pedro north.

At San Diego there has grown up a fishing business with some phases peculiar to that port. The statistics of San Diego fisheries include 28 boats manned by whites and 30 boats manned by Japanese, which fish exclusively for tuna and albacore during the canning season, and at the end of that period the boats are tied up. In addition to these, there are 48 boats which fish for albacore and tuna for the canneries and during the rest of the season fish for the fresh fish markets. That phase of the fishing industry peculiar to San Diego employs 29 gill net boats owned and manned principally by Italian fishermen and fishing exclusively for fresh fish markets. These boats are very



California sardines in the cockpit of a California fishing boat taken from the wharf of a cannery at Monterey Bay Scott, Photographer

successful. The Italian fishermen not only are very industrious, but prosperity is seldom allowed to interfere with their industry. The majority of their boats are equipped with two complete sets of halibut, sea bass and barracuda gear. While fishing with one set of nets the other is left ashore and is being mended and tanned so that when a good run of fish is on no time is wasted for lack of condition in the equipment.

The financial agreements under which these Italian fishermen operate are quite inter-

esting. The great majority of their catches are in Mexican waters. The markets guarantee to take all of the fish that may be brought in on each trip, at a stipulated price. The markets also agree to pay the Mexican government one cent per pound on all fish brought in from Mexican waters.

Another interesting feature of the situation in San Diego is the importation of lobsters from Mexico.



Part of the fishing fleet at anchor in Monterey Bay. Note the various types

Scott, Photographer



The Junta, a typical California fish cannery tender

There are about 50 lobster camps established along the coast of Lower California and Mexico with a total of about 150 men divided as to nationality about as follows: 30 per cent Mexican, 40 per cent Japanese, and about 30 per cent American. The equipment used in these camps is extremely varied, comprising everything from simple skiffs through Evinrude outboard motors to small power boats of from 5 to 10 H. P. Several gasoline engine and Diesel engine carriers are used to pick up the lobsters from the camps. One new boat recently brought out from the Atlantic Coast is a converted "subchaser" with two 125 H. P. Diesel

engines. The duty on lobsters at present is about 2½ cents per pound.

Summarizing, we find that California leads all the states of the Union in the volume and value of fishery products; that in 1920, a rather low year, 213,800,000 pounds of fish were caught in California waters, 118,500,000 pounds being sardines, 11,134,000 pounds being salmon, balance tuna, albacore, barracuda and miscellaneous fish; that the total value on conservative estimates of the boats used is over \$5,000,000 and the value of the nets and gear almost \$2,000,000; that the industry has grown so rapidly during the last ten years that the great majority of the boats in use are conversion jobs, making the best out of the material at hand to meet existing conditions, and that therefore in the next four or five years there should be a very considerable demand for new boats designed to meet the requirements which experience has dictated must be met in order to make good under modern competitive fishing conditions.

IMMIGRATION

THE appended table shows the division of admissible aliens as fixed by the act "to limit the immigration into the United States" passed by Congress May 19, 1921. There seems to be quite a difference of opinion among experts as to the propriety of this sort of division, and from figures at hand the rate of net immigration just prior to the passage of this act was scarcely larger than, if equal to, the rate which would be permitted by the act. One peculiar feature which seems to stand out prominently is that this act allows a very much larger number of Germans to enter than were entering at the time the act was passed.

Anticipation of the passage of this bill created quite a flurry in immigration from southern Europe and resulted in a congestion at Ellis Island which necessitated emergency action on the part of Congress slightly changing the application of the act so as to allow entrance to all aliens who had taken passage for America and were actually en route before the date set for application.

The table will be of interest to operators of passenger steamship lines and others who are figuring on immigration business.

TABLE OF ALIENS ADMITTED UNDER THE ACT OF MAY 19, 1921, BY COUNTRY
AND SEX TO LIMIT THE IMMIGRATION INTO THE UNITED STATES

Country or place of birth.	Quota		1921	
	June 3-30, 1921	Fiscal year 1920-21	Fiscal year 1921-22	Year ending 1921-22
Albania	22	287	57	
Andorra	571	1,000	1,465	
Belgium	119	1,777	311	
Bulgaria	23	261	60	
Czechoslovakia	1,075	14,286	2,890	
Denmark	22	285	57	
Egypt	413	5,664	1,187	
Finland	258	3,810	778	
France (1)	5	71	14	
France	477	5,602	1,134	
Germany	5,215	68,077	13,608	
Greece	852	1,146	657	
Hungary	452	5,635	1,127	
Italy	3,204	50,024	9,800	
Japan	491	6,400	1,211	
Luxembourg	7	28	18	
Netherlands	276	3,162	700	
Norway	510	12,116	2,421	
Poland (2)	1,508	20,019	4,006	
Poland (3)	461	5,715	1,156	
Portugal (including Azores and Madeira Islands)	177	2,869	554	
Rumania	565	7,414	1,493	
Russia (including Siberia)	8,627	10,287	6,800	
Siam	51	643	133	
Sweden	1,511	11,198	1,774	
Switzerland	287	3,745	762	
United Kingdom	5,287	77,000	15,444	
Other Europe (including Andorra, Gibraltar, Montenegro, Malta, Monaco, San Marino, and Iceland)	6	85	17	
Armenia	122	1,586	316	
Polynesia	4	56	11	
Byzantine District (3)	34	54	88	
Syria	69	505	101	
Other Turkey (Europe and Asia)	15	215	45	
Other Asia (including Persia and territory other than Persia which is not included in the Asiatic Bared Zone. Persons born in Persia and included in the Persian quota.)	6	78	16	
Africa	9	100	24	
Australia	23	271	54	
Islands	4	50	10	
Atlantic Islands (other than Azores, Madeira, and islands adjacent to the American continent)	5	60	12	
Pacific Islands (other than New Zealand and islands adjacent to the American continent)	2	22	4	
TOTAL	27,556	355,125	71,163	

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AN ELECTRIC FISH BARRAGE

THE irrigation ditch, a comparatively new product on the Pacific Coast, while of great benefit in developing the arid lands in certain sections, as at present operated is a considerable menace to the salmon fisheries. It is estimated that each year between 3,000,000 and 4,000,000 young salmon, slowly making their way down stream to the ocean home, pass into these ditches and are left to die when the water is drawn off.

To cope with this situation numerous devices have been tried. Placing at the head of the ditch a screen with a mesh fine enough to prevent the small fish from passing through proved ineffectual. The drift and waste carried down by the current would clog the mesh, and the waters carrying the young fish would flow over the top of the screen and out onto the adjacent ground. Several other means of remedy were attempted, but only with partial success.

Even were the screen to remain clear, the mode of progress of the salmon fry down stream would make impracticable the use of a screen. Salmon almost universally swim head on to the current, and their progress down stream is very slow in comparison with the current. The tail fins of the young fish are very soft and flexible, and it has been found that they become entangled in any screen set across the current and large numbers of the fish die right in the screen. The impracticability of screens for stopping young fish has been demonstrated in the intakes of many power canals in hydro-electric developments along the Pacific Coast.

Finally after giving the problem much serious study and making numerous experiments, C. D. Hessey, game commissioner of Yakima county in Eastern Washington, worked out an electrical barrier. This new invention is the electric fish stop, and the photograph accompanying this article makes its method of operation plain.

The electric fish stop is placed across the head of the irrigation ditch. A small water wheel and a magnet furnish the power. Small iron bars are set four feet apart on the front of the device extending down into the water. By a system of wiring and a vibrator to regulate the current the water is charged with electricity for a distance of about four feet from the bars. Fish coming down stream with the current strike this



View in a dry irrigating ditch showing young salmon left to die by receding waters.
Photo J. N. Cobb, College of Fisheries, University of Washington

charged water and immediately whirl around and continue on their way instead of going on into the irrigation ditch.

The electric fish stop shown herewith is one of two already in use in the Yakima, Washington, district, and construction of a large one is now under way for the Sunnyside Canal. Men familiar with the irrigation ditch problem are confident a successful solution has been found. Also, it is stated, the same device could be used to establish rearing ponds in any stream. It could be so placed as to make any size pond desired and the fish would be kept within the charged area. The invention is new. This is the first season it has been tried out, but there is every indication that it is a success.



The head of an irrigation ditch near Yakima, Washington, with electric fish stop installed.
Photo J. N. Cobb, College of Fisheries, University of Washington



California Sardines and California tomatoes being delivered at the wharf of a river cannery. Both go into the same can

NOTABLE GROUP AT A NOTABLE LAUNCHING



Group at the launching of the West Chopaka, September 19, 1921. Los Angeles Shipbuilding and Drydock Company, Los Angeles. Right to left: Meyer Lissner, United States Shipping Board commissioner representing the Pacific Coast; George E. Cryer, mayor of Los Angeles; Erie M. Leal, vice-president Los Angeles Shipbuilding and Drydock Company; Mrs. Fred L. Baker, sponsor West Chopaka; Fred L. Baker, president Los Angeles Shipbuilding and Drydock Company; Joseph J. Tynan, general manager Union Plant of the Bethlehem Shipbuilding Corporation, Ltd., San Francisco.

WITH the launching at the plant of the Los Angeles Shipbuilding and Drydock Company on September 19, 1921, of the 12,000-ton freighter West Chopaka, there was consigned to the waters of Los Angeles Harbor the last of the ocean carriers of the war emergency program of the United States Shipping Board.

The launching of a ship has always been an occasion for moralizing, and undoubtedly many American citizens will be looking back over the war accomplishments of the United States Shipping Board with feelings of mingled pride and humility.

We are all proud that it was given to us as Americans through our Shipping Board to make such a splendid contribution toward the winning of the great war as is represented in the great merchant marine fleet now owned by us and operated under the guidance of the Emergency Fleet Corporation. On the other hand, we are forced to be humble as we realize that through circumstances entirely beyond our control this fleet, which we had hoped would become a commercial asset, must now very largely be looked upon solely as a war contribution which has no inherent ability for self-support under present conditions.

The West Chopaka completes a total of 2312 ships aggregating 13,636,711 tons. All these ships built in less than five years, an average per year of more than five times the normal output of the United States in the ten years preceding the war.

The first launching of this program occurred at the Staten Island Shipbuilding Company, Port Richmond, New York, May 29, 1917, the second launching at the Moore Shipbuilding Company, Oakland, California, August 25, 1917, and the third at the Fore River plant of the Bethlehem Shipbuilding Corporation, October 27, 1917. Deducting these three from the 2312 above we see that 2309 vessels have been launched by the Shipping Board in less than four years, averaging approximately two vessels per working day during that time.

Much has been written and spread on the pages of our public prints concerning graft and inefficiency in this shipbuilding program. We take no stock in the bulk of such material, knowing very well that had the high prices for shipping tonnage been sustained at the levels of 1918 and 1919 there would have been no talk of shipbuilding graft.

It is only when compared with the present low levels of prices procurable for steam tonnage that Shipping Board costs, taking into consideration war conditions, seem at all excessive.

We can say proudly that the cost of the shipbuilding program, considering the results of that program, would compare very favorably with the costs of any war activity either of our own government or of any government of the Allies.



A. J. FREY

Vice-President U. S. Emergency Fleet Corporation in charge of physical operations

Once more the Shipping Board chairman has come to the Pacific Coast for a practical steamship operator. While born in Heidelberg, Germany, June 6, 1873, A. J. Frey very early in life evidenced that practical common-sense which has marked his career as an organizer, by bringing his family to California in 1883. Graduating from the California public school system, he entered journalism in the newspaper field, remaining in the mechanical and news departments of a San Francisco daily from 1892 to 1899. In the latter year he secured a position as secretary to R. P. Schwerin, vice-president and general manager of the Pacific Mail Steamship Company, and was rapidly promoted to the position of assistant general manager, occupying later in succession the active management of the Portland and Asiatic, Occidental and Oriental, and San Francisco and Portland Steamship companies, then affiliated with the Pacific Mail. In 1915 Mr. Frey organized the China Mail Steamship Company. Later he reorganized the purchasing and supply departments of the Associated Oil Company and affiliated companies. In 1918 he became assistant district manager of ship construction for California under the Emergency Fleet Corporation, and in 1919 was appointed district manager. In 1920 he became vice-president and general manager of the Los Angeles Steamship Company and established the present express passenger service between Los Angeles and San Francisco. Mr. Frey now faces the gigantic task of keeping in operation 13,000,000 tons of ocean shipping, and in this task he should have the patient co-operation and loyal backing of every American citizen. He is a practical man and knows his business well.



W. J. LOVE

Vice-President Emergency Fleet Corporation in charge of traffic department

Mr. Love is considered one of the foremost experts on traffic management among the younger executives of the ship operating companies, with headquarters at New York. For a considerable period prior to the acceptance of his present position he had been traffic manager in New York for the great British steamship firm, Furness, Withy and Company. In that connection he has become intimately acquainted with traffic problems in all the seven seas. There is hardly a trade carried on by sea water anywhere on the globe in which Furness-Withy have not at some time or other been operating steamers. Mr. Love will, therefore, bring to the solution of the problems connected with his office a ripe understanding and a thorough, practical working knowledge which should speedily bring order out of what has been largely chaos.

ALL HANDS

IN the early days of the sea when occasion arose to communicate anything in which all hands were interested, it was the custom to muster the crew aft and there tell it to them face to face. Conditions are different today, but the occasion arises at times when there's a message to be put over in which all hands are interested. Such an occasion is here now and all hands on every American ship are interested in what we have to say.

There is no quarter deck on which such a crew could be mustered, so we're sending the message in the form of a pamphlet, which you can read and think over on your watch below.

The United States government—the only union to which every American citizen owes first allegiance—is pledged to the task of building up and maintaining a great merchant marine. This can be carried out only with the help of all hands.

Best Work Conditions in World

The shipping laws of this country guarantee the American sailor safety, comfort and financial protection, such as no other country could afford to offer. These laws, while making seafaring a more inviting career, have added tremendously to the expense of operating ships. In fact, it will be impossible to operate them in competition with the world unless the personal service thus protected is of such a surpassing efficiency that it overcomes the great cost.

Our coastwise shipping exists almost entirely because through the coastwise shipping laws foreign competition has been shut out. In this way part of the burden of the high cost of operating American ships has been shifted indirectly to the shoulders of the general public. This high operating cost in the past automatically shut us out of trade open to foreign competition. The same thing can happen again and unless by greater efficiency we are able in the coastwise trade to offset this higher cost there will come a day when the country will weary of furnishing a protection which adds only to its own cost of living and will let the foreign ships compete for our coastwise traffic.

In a large measure this is up to you.

We can't have efficiency in the personnel of the American merchant marine as long as there is division of allegiance.

"No Man Can Serve Two Masters"

Here is a typical admonition from the "regulations" of the Masters, Mates and Pilots of the Pacific:

"Before shipping see that all of the mates are members of the association; if they are not—think twice. At all times before shipping or when leaving a ship, consult the secretary, agent or business manager, by calling at the association rooms or by telephone. It will be to your interest to follow instructions."

Here is another:

"Let the password be, 'Do your duty to the association, hammers over the side, let all hands be more than brothers of the sea, do not be divided, stand as one man,' then you will reap the benefit by better conditions, and not otherwise."

If in the latter quotation the Masters and Mates would substitute "American merchant marine" for "association," their password would point the way to a course of action worth any man's while.

In the constitution and by-laws of the Sailors' Union of the Pacific, which may be taken as typical of the "supreme law" to which marine workers other than licensed officers have bowed, it is frankly admitted

that the union is based on the principle of its members getting all they can from the employer and giving as little as possible, and that only incidentally. Although the seafarer is dependent for his very life on the protection afforded him by the laws of the United States government, the oath or obligation that he assumes on joining the Sailors' Union is not of allegiance to the flag that protects him. Here's the oath:

"I pledge my honor as a man, that I will be faithful to this union until death; that I will work for its interest and will look upon every member as my brother; that I will not work for less than union wages and that I will obey all orders of the union. I promise that I will never reveal the proceedings of the union to its injury or to persons not entitled to know the same. And if I break this promise, I ask every member to treat me as unworthy of friendship and acquaintance. So help me God!"

Lives Depend on Discipline

A sailorman shouldn't have to be told that the safety of life at sea depends on the maintenance of a proper discipline. Anybody knows that nothing will ruin discipline as quickly or as completely as having too many bosses. Your very life then depends on this discipline which is made impossible by the divided allegiance demanded by maritime unions and so-called beneficial associations.

Without discipline your lives are imperiled and the efficient operation of shipping is impossible.

Whenever a law has been passed adding to the expense of operating American ships, the champions of the law have protested that the superior efficiency of the American crew would offset this additional expense and that it wouldn't, consequently, count against the American ship in the fight for business against foreign competition. To put this theory into practice would require the absolute and whole-souled allegiance of every worker, from master to galley boy, to the task of making the American merchant marine the most effective working organization in the world.

In the last analysis, the existence of the American merchant marine depends on the ability to perform certain services either better or for less money than anybody else. If we can do this we can build up the greatest merchant marine the world ever saw. If we can't do it, all the laws for bettering the conditions for seafarers, all the unions, all the associations, won't mean anything for the reason that there will be no American merchant marine.

American Steamship Association.

Shipowners' Association of the Pacific Coast.

OUR COVER

THIS issue of Pacific Marine Review has for its cover subject the reproduction of a photograph showing the new United States dreadnought California in the graving dock of the Union plant of the Bethlehem Shipbuilding Corporation at Hunters Point.

The California was built at Mare Island Navy Yard, San Francisco harbor, and is the largest vessel yet completed on the Pacific Coast. She has a full load displacement of 33,190 tons, a length over-all of 624 feet, and a beam of 97 feet 3 1/4 inches.

Hunters Point dock is the largest commercial graving dock in the United States, having a length of 1000 feet, a width at sill of 110 feet, and a depth on sill at ordinary high water of 40 feet.

IN THE DAYS OF THE CLIPPERS

WITH the story of the clipper ship *Three Brothers* we are beginning a series of histories of famous sailing ships that will appear from time to time in forthcoming issues of *Pacific Marine Review* under the authorship of F. C. Matthews of San Francisco, who for nearly fifty years has made a hobby of keeping track of his old favorites.

As we were considering this series, there appeared in two of our contemporaries the poems reproduced below, which form so beautiful an introduction that we are reprinting them here. Both poems relate to exactly the same phase of life in a sailing ship, yet in their treatment of this subject they could not well be more different. Both voice the real appeal of the sea to the heart and mind of all of those who have Viking blood in their veins, and apparently this appeal is just as potent to the real sailor, whether he be fighting the sea in the lee scuppers or navigating a ship from the quarterdeck. The real incentive seems to be the thrill which comes to every man when he is able by his own skill and will to overcome the elements bent on his destruction.

EASTING DOWN

JUST for a moment still the hissing steam,
And southward lift free Fancy on swift wing
To traverse once again the steep ravines
And mountain ranges of that regal sea
That rolls around the Cape and round the Horn.
No idle words, for like the land, the sea
Hath mountains and wide valleys and vast plains;
And I, on yardarm's giddy perch, have gazed
From foaming crest of billowy Snowdon
Into the yawning gulf below and thought
This surely is the Hollow of God's Hand.
Thence, swooped as on an avalanche, and felt
As if my body's lower half had gone
And left its blood to crowd the arteries
That lead through upper half to heart and brain.
My face would flush and o'er me there would come
A fierce desire to holla with the gale.
So to the depths and then, without a pause,
Lift on the next great surging slope and mount
Skyward like thought inspired, till on my view
There burst a scene magnificent, sublime;
Foaming Sierra ranges, ridge on ridge,
With summit, cleft and valley, peak and spur.
And then to downward glance, and watch the ship,
One of the Clyde-built darlings slim of waist,
Run from the chasing waves like maid who runs
From over eager arms of lover fond;
The pride of clippers at her racing bows,
And in her wake the sea birds great and small;
The mottled pigeon and swart Cape hen,
The tiny Mother Carey and the dove,
The roving molyhawk and, lord of all,
The proud beaked albatross on soaring wing;
And singing through her cordage and her sails
The vigor of the voices of the wind.
Ah, dear, those days of easting down, those days;
When, to the merry southwest gales, we swung
The saucy royals, and veiled them only
When, like boisterous boys from school, the squalls
Would romp upon us in their haily glee,
And hustle us a moment from our course,
Raising the stand-by call along the deck;
So pass, and leave us to adjust ourselves,
As young boys leave their sisters, half in tears,
Half smiling, after the rude embracing
That disarranged the dressing of the hair.
We sighed to sight a steamer on such days
When, from the rattling reel, the line rushed out
And made the fourteen seconds seem an age.
I've seen the fifteenth knot outside the rail
Not once, but many times, down Forty-five.

JOHN ANDERSON, in *The Nautical Magazine*.

RUNNING THE EASTING DOWN

YOU can prate of yer ocean racing and swift Cun-
arders too,
That skip The Ditch by power of steam and the
thrust of a mighty screw.
You may thrill in the Aquitania or ships of like re-
nown,
But gimme a trip in a clipper ship when running her
Easting down.

D'ye mind the day when we squared away and ran her
East by South?
When she trampled down the big Horn seas with a
roaring bone in her mouth,
When the best hands twirled her bucking wheel and
dared not look behind
At the growling grey-back in her wake. . . D'ye mind,
old pal, d'ye mind?

Them were the days with the life-lines strung from
the poop to fo'c'sle head,
When the cook 'n stoo' had their work cut out to give
us our daily bread,
When the dollops came thundering over the rails and
flooded the decks in a broil,
And us poor devils were plunged to the necks as we
hoisted and sheeted a royal.

D'ye mind the smile in the Skipper's eyes when he
summed her daily run?
And the blighter would hang to his rags aloft 'til a
gan's'l banged like a gun,
And the cloths of it flogged from the bolt-ropes and
canvas-threads whitened the stay. . .
It was "Leggo that mizzen t'gallant, me sons; 'n aloft
and cut it away!"

It was wonderful square-yard sailing, m'lad, and glori-
ous storming through
The watery hills of fifty south with bar-taut brace
and clew
And preventer-sheets on the tops'ls, and the fores'l
arched like a bow,
As she ran like a hound to the East'ard,—'n, Lord, how
the hooker did go!

Ye can have yer steam-boat racing, but gimme the run
in a gale
Of a well-gear'd able clipper what is driven by snow-
white sail.
For I've known the thrill of a piling sea and the sky
in a cloud-flecked gown,
And fourteen knots in a wind-bag when she's running
her Easting down!
FREDERIC W. WALLACE, in *Canadian Fisherman*.

THE CLIPPER SHIP THREE BROTHERS

By F. C. MATTHEWS

IT has been considered appropriate to begin our series of clipper ship histories with an article on the world-famous Three Brothers, whose reconstruction, its financing, and its successful accomplishment were all San Franciscan, the ship itself being everywhere regarded as a San Francisco product.

As the merchant steamship Vanderbilt, she was built by Jeremiah Simonton at Greenpoint, Long Island, 1856-7, for Commodore Vanderbilt's North Atlantic Mail Steamship Line operating between New York and Havre. The other steamers of the line were the Adriatic, 4145 tons, and Illinois, 2124 tons, the Valderbilt's tonnage being 3361. All were wooden side-wheelers of clipper model. These were running in 1860, but shortly afterwards they were withdrawn, due to lack of governmental support, and the discontinuance of this line left no American steamers engaged in trans-Atlantic traffic.

The Vanderbilt was then considered the fastest steamship afloat. On her third voyage she arrived off The Needles in 9 days 8 hours from New York, the fastest time on record to that date; ran 350, 337 and 333 miles on successive days. In June, 1858, she reached dock at New York in 9 days 13 hours from Southampton, best on record, and the following year made the run from The Needles to New York in 9 days, 9 hours, 26 minutes. Captain Edward Higgins, who came to San Francisco in 1874 to take over the agency of the Pacific Mail Steamship Company, was commander of the Vanderbilt when she made the (then) record passage from New York to Southampton in 9 days, 5 hours, being one-half hour better than the time of the Persia, which had been represented as the fastest steamship afloat.

In 1861, as a United States war steamer, the Vanderbilt was presented by Commodore Vanderbilt to the government, fully outfitted as a vessel of war, and she was immediately sent to Hampton Roads to run down the Merrimac, should the latter attempt to get to sea. She was afterwards put on the trail of the Alabama, which, however, successfully evaded her.



The U. S. steamer Vanderbilt presented by Commodore Vanderbilt to the United States government in 1861

Her first appearance in the port of San Francisco was on June 22, 1866, when she arrived from Hampton Roads conveying the monitor Monadnock. She then bore the broad pennant of Commodore Rodgers, her commander being J. P. Sanford. She was described as of 3100 tons, 2800 indicated horsepower; crew of 386, officers and men; the swift-

est and one of the largest wooden war steamers afloat, which had "borne our starry flag over half the globe," as the papers had it.

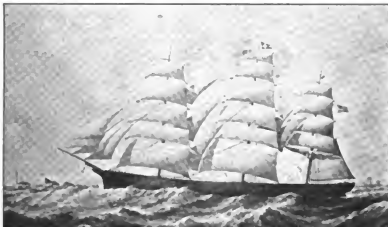
In 1866 Commodore Vanderbilt received the gold medal which the government had voted him for his princely gift. The ship when turned over by him had been furnished with a battery of fourteen heavy guns on the main deck and two long Parrott guns on the upper deck. She afterwards had her upper cabins cut away and her guards lowered.

In August, 1863, when in charge of Commander C. H. Baldwin and in chase of the Alabama, the Vanderbilt came across the dismasted and rudderless Dutch bark Johanna Elizabeth, from Batavia for Amsterdam with a valuable cargo and fifteen passengers, consisting of Dutch army officers on leave and their families. Commander Baldwin successfully towed the bark into Simons Bay, Cape of Good Hope, and as all claims for salvage were waived, the Dutch government and all interested were very profuse in their acknowledgments of appreciation for the service rendered. The disabled bark had been for over five weeks drifting back and forth over her own tracks and was in a very dangerous situation.

In 1866 the Vanderbilt made a trip to Honolulu, taking to the Islands Queen Emma and her suite, the party having been touring here. From this time until she was sold, the ship was kept at Mare Island.

From Steamship to Sailing Ship

The Vanderbilt was sold under the hammer at Mare Island March 27, 1873, to George Howes & Company for \$42,000 currency. Official documents shed a very interesting light on this sale, especially when viewed in connection with the pres-



American clipper ship Three Brothers. Length over-all 350 feet, breadth 48 feet, depth 31 feet, registered tonnage 3360

ent efforts of the United States Shipping Board to sell our great merchant marine fleet. In February of 1873 the Vanderbilt was put up for bids. The largest bid was \$56,000 gold. She had previously been appraised by the Naval Board at \$80,000, and the bids were all rejected. Six weeks later came a peremptory order from Washington that she be sold at auction, with the result noted above. Her purchasers sold the engines for \$20,000 gold and salvaged stores and materials to an additional \$12,000 gold, so that the hull, ready to be reconditioned into a fine clipper ship, cost them \$7000 gold, which even for those days was a great bargain.

Work on reconstruction was begun April 13 at Hunters Point, San Francisco, by Coombs & Taylor under the supervision of Captain Robert W. Waterman and continued until ship was loaded and ready for sea, October 23. Cost of rebuilding was \$175,000 gold. Her length for tonnage purposes was given as 312 feet 6 inches, beam 48 feet 8 inches, and depth of hold 21



Reproduction of panel in the old San Francisco Merchants' Exchange showing the scene in San Francisco Bay as Three Brothers was towed out on her maiden voyage. Shown in the picture above are, inward bound, the bark Clara Bell, and Powhatan, the schooner Caroline Mills and Margaret Crockett, and the German corvette Nymphe. Out-bound are shown the bark Clara Bell and the brig Josephine and Crimea. The tugs Rescue and Neptune are towing the Three Brothers, and the steamer Princess is following with excursionists.

Panel painted by Coulter

feet 6 inches. She had three full decks and beams for a fourth lower deck, and her total depth to spar deck was 32 feet. Her registered tonnage was: below deck 1922.91; between decks 967.47; above deck 81.79; total 2972.17 tons. Her upper works were raised 14 inches and a handsome shear given her. From plank shear to bends, she was 2½ feet thick, solid wood, and below that, 3 feet mainmast, 98½ feet long, 44 inches diameter at deck, without a single knot or flaw; main topmast, 56½ feet long, 20-inch diameter at cap; top-gallant, royal and skysail mast, one piece, 70 feet long. Foremast itself was 3 feet shorter than the main; all other dimensions of other masts on the fore were the same as those of the main. Main yard, 100 feet long, 29 inches diameter in the slings; lower top sail yard, 87 feet 20 inches; upper, 78 feet by 18 inches; top-gallant-yard, 55 feet by 13½ inches; royal, 41 by 11 inches; skysail-yard, 33 by 9 inches. Yards on forecast the same. Bowsprit 50 feet, 40-inch diameter at Knight Head; jibboom with flying-jibboom, 65 feet by 19 inches at cap. Under full sail spread 15,000 yards of canvas, the mainsail alone containing 1010 yards.

She was renamed Three Brothers after the three Messrs. Howes, owners.

Her Career as an American Ship

Friday, October 24, 1873, was a momentous day in San Francisco shipping circles, for it was the commencement of the career of the world's largest mer-

chant sailing vessel. Precisely at noon the tug Neptune left Pacific Mail Dock with a party comprising the master of the big ship, Captain George Cumming (formerly of the clipper Young America, same owners), and his wife; the Messrs. Howes, of whom Jabez went in the ship to Havre; the pilot commissioners; a number of leading merchants; Pilot Nathan; and last, but not least, a band of music. The tugs Neptune and Rescue began towing at 1:15 p. m. to the tune of "Good Bye, Eliza Jane" by the band. The wharves were crowded with cheering multitudes, while the noise from innumerable whistles was deafening. The clipper ship Herald of the Morning added her quota to the din by saluting with her two guns, shortly afterwards being followed by the guns from Fort Point and from an inward-bound revenue cutter. An excursion party on the steamer Princess followed the ship until past Fort Point, and amidst music and continued cheering, the tugs dropped their charge eight miles outside. When Pilot Nathan left the ship at 5 p. m. she was under full sail, courses to skysails, going off close hauled, in a fine westerly wind.

The voyage thus auspiciously commenced was brought to a successful termination off the port of Havre, at daylight, February 13, 1874; time of passage, 111 days 12 hours; took pilot off Falmouth 108 days 16 hours out. Captain Cumming had made the Horn in 54 days and was on the line the 86th day. Best day, February 5, 314 miles in strong northeast by north winds. Least day, 10 miles, though had several days under 20 each. Total distance sailed, 16,073 miles. Beat, by three days, the British iron clipper British King, whose San Francisco backers had considerable money up that she would outrun the "big brother," but as "Along the Wharves" in the "Alta" had it, "Kings weren't trumps this deal." Three Brothers by her passage also won for her backers their wagers that she would arrive at Havre not later than Young America (from New York, October 29) would reach this port; as it was both ships arrived at their respective destinations on the same day, but "big brother" was several hours ahead. Completing her first voyage, Three Brothers crossed from Havre to New York; loaded 4800 tons general cargo and reported herself at this port November 8, 1874, after a passage of 132 days. With much light and head winds and 13 days of calms in the North Atlantic, and then taking 9 days to make the run from 4 degrees south to 7 degrees south, she retrieved herself by making the fine time of 85 days from the latter point into port.

Second voyage: Sailed hence December 28, 1874. Took British pilot April 14, 1875, 107 days out and anchored at Liverpool three days later, 110 days. Reported light winds to the line, 23 days; passed Cape Horn in 50 days and was again on the line on 80th day out. Distances run weekly were: 520, 853, 1114, 1559, 1104 (one day 282), 1350, 1378, 1405 (one day 310, under all sail, running about seven points free and frequently logging 15 knots), 883, 839, 563, 1471, 1472, and for week ending April 12, 1092. Log showed that on March 4 in South Atlantic "spoke British ship Derbyshire (left San Francisco 26 days before us) and dropped her out of sight in a short time. Soon after came up with and passed the ship Oakland (left San Francisco 11 days before us)." The "big brother" also beat the crack Britishers, America, British King and British Peer, all sailing about the same time, the first by 19 days and the last named by 27.

Completing this voyage, Three Brothers arrived here October 24, 1875, after a tedious passage of 134 days from Liverpool. Had hard luck in the North Atlantic,

36 days to the line; no trades in South Atlantic and 19 days of strong gales off the Horn. However, she came up from 50 degrees south in the Pacific to within 600 miles of this port in the excellent time of 42 days. Thence, however, luck again deserted her and for 14 days she had light airs and calms and was inside the Farallones for three days in a dense fog.

Third voyage: Sailed hence December 23, 1875; arrived in the Channel 105 days out and anchored at Liverpool April 9, 1876, 108 days. Was 13 days 15 hours to the line, a very fine run; passed the Horn in 48 days and crossed the line 76 days out, good time thus far, but thence had adverse winds. During the seventh week out made 1457 miles; on January 31 logged 318.

Completing this voyage Captain Cumming brought his charge safely into this port, January 13, 1877, in 116 days from New York. Had a fine run of 52 days from the Horn to the Farallones, off which lost some sails in a heavy norther the day before arrival.

Fourth voyage: Left here March 17, 1877. Had 19 days to the line; 52 days to the Horn and was on the line in the Atlantic 77 days out. Made Fastnet light June 26, 101 days out; anchored in the Mersey 29, 104 days. During week ending June 9 made 1600 miles; and for the last eight weeks of the voyage ran 10,044 miles. Made the fastest passage of any vessel sailing about this time, beating Patterdale by 10 days, Langdale by 8 days, Benmore by 13 days, Charger by 16 days, all ships noted for speed.

Three Brothers rounded out this voyage by arriving here January 8, 1878, 112 days from Liverpool with 3473 tons of coal. Had uniformly fine weather; was but 11 days from 50 degrees south in Atlantic to 48 degrees south 86 degrees west in Pacific—was off this port and within 300 miles for 8 days. This voyage was her fastest, 216 sailing days on the round.

Fifth voyage: This was a round to New York between dates, October 11, 1878, and September 19, 1879; time outward, 111 days; return, 134 days. Took hence 3258 short tons barley. Have no memoranda of outward trip. On return had nothing but unfavorable weather and winds; 31 days to the line; thence 34 to the Horn; thence 31 to the Pacific Line with much heavy weather, gales and violent squalls in South Pacific; and as if to finish consistently, head winds kept her 38 days from the line to port, off which she was also detained two days in a dense fog.

Sixth voyage: Sailed hence November 24, 1879; arrived at Liverpool April 4, 1880, 132 days passage.

This was the last run of Three Brothers under the American flag, for following the suspension of her owners, she became the property of Mr. John Williams, a partner of James Baines of old Black Ball Australasian clipper packet fame.

Three Brothers Under the British Flag

In recent correspondence to the Liverpool Weekly Post, Captain Mathias, who was in command of the ship during her career as a Britisher, states that he was persuaded, much against his inclination, to go out as master, but that the sequel proved that he was fortunate and made good passages. To quote from Captain Mathias further: "She was very fast and I do not think could be beaten. She was a favorite ship at Antwerp, where we loaded general cargo, principally glass, for 'Frisco.' Finally freights got so low for wheat that a great many ships were laid up, and it was difficult to get so large a cargo in one ship, so when I arrived at Liverpool in July, 1885, she was laid up and shortly afterward sold to the Anchor Line to go to Gibraltar as a coal hulk; being of great length,

those round-mainsail fellows can lie alongside comfortably to coal. I have often wondered why the Germans did not destroy her during the war."

Her record as a British ship follows:

Arrived at Wilmington, California, August 3, 1881, 134 days from Liverpool; discharged 3000 tons coal; came to San Francisco; discharged 1000 tons; loaded 90,435 cents of wheat (the largest amount carried in her history), and arrived out at Antwerp January 28, 1882, 105 days passage. Cargo turned out in excellent order. Loaded general cargo and sailed from Antwerp May 2. Arrived here August 22, 1882, 117 days out; 112 days from dropping pilot off the Lizard. Was 62 days to the Horn and was on the Equator 90 days out. In the South Pacific Captain Mathias got caught in the bight of the spanker sheet and broke his leg. Log had the terse entry, "Set same with the assistance of the steward." The mate took charge and brought the ship safely into port.

Sailed hence October 28, 1882, for Antwerp. Had been ready several days previously, but the crew had refused duty, and finally Captain Mathias had to get a shore gang to heave up anchor. Put into Plymouth March 15, 1883, 138 days out, with mutiny aboard: there was trouble all the voyage out and six of the crew had refused all duty the whole passage.

Vessel proceeded to Antwerp; discharged; loaded and arrived here December 21, 1883. She lost her rudder and was some six weeks at Rio replacing it. Thence she had the very quick passage of 72 days to this port. She bade a final farewell to her former home port on March 7, 1885, when she got away for Liverpool; arrived out July 8, in 123 days, and was sold as heretofore stated.

Authorities who have seen her within ten years or so past say that she was then in good condition, her sides being very smooth and seams about as narrow as those of a new ship. The Norwegian steamer Tricolor, a former well-known trader to this port, discharged a cargo of coal into her not many years since.

So here we will take leave of our old friend. Still serving a useful end, rounding out a strenuous career of nearly three quarters of a century, in which she always "made good," for her builders build well. Little did the writer think over forty years ago, while sitting on the wharf stringer watching the husky stevedores in their back-breaking job, as, steadily and regularly as machinery, they lifted the bags of grain by stages over the ship's bulwarks, sliding them down into the huge hold and bleeding them now and then for good stowage, that he would ever have the pleasant task of compiling the history of one of the best known and most celebrated ships the world has ever seen.

Anyone desiring to inspect a correct model of this celebrated ship can find one in the Nautical Room, Golden Gate Park Museum. Although the model is named Emma, it is actually Three Brothers, and is rigged with four masts which Captain Cumming always claimed she should have had. This model, a magnificent piece of workmanship, was built aboard ship by Captain Cumming during a period of six years. Everything is in exact proportion and ship shape: each block, even the smallest, has its shive and is in running order; the standing rigging is of silver wire, laid by Cumming, who also turned out of ivory, masts, yards, blocks, etc. The model was raffed off at the Merchants Exchange in December, 1882, and although the writer held a number of tickets, the lucky man proved to be popular Frank Middleton, master stevedore. The model was at that time appraised at upwards of \$1,000.



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 A. J. DICKIE Editor
 ANDREW FARRELL Associate Editor

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WHAT IS WRONG WITH THE AMERICAN MERCHANT MARINE?

MANY American citizens have been asking themselves during the past year the questions, "What is wrong with the American merchant marine?" And with the United States Shipping Board?" There have been all sorts of attempts to frame up answers to these questions by Shipping Board officials, various members of Congress, senators, politicians, shipbuilders. In fact, all classes of the American people have in one way or another had a hand in the propaganda which has been appearing in the public press from time to time concerning these questions and a possible solution.

Practically all of the material that has appeared, however, seems to ignore the fundamental difficulty with not only American shipping but world shipping at the present time. A great deal of loose talk is indulged in concerning former American supremacy in merchant marine, concerning a return to pre-war prosperity in merchant marine matters, concerning tremendous sums of money alleged to have been paid annually to foreign ships for the carriage of American freight, and concerning so-called foreign propaganda at Washington for the destruction of the American merchant marine which has been built up at the cost of so much treasure.

We are continually having congressional investigations of the Shipping Board and Emergency Fleet Corporation, every investigating committee finding tremendous evidence of graft, of criminal carelessness, and of official incapacity, and every Congressional committee uniformly, after so finding, "whitewashing" everybody concerned and arriving at the point of departure in ballast just as they started out.

The chief difficulty today in the world's shipping

is that there are too many ships and too little freight. One remedy for this—the laying up of ships—is automatically applied and has been applied in all ports of the world, both as regards American ships and as regards the ships of every other nationality. The other remedy—that of getting down to hardpan, going to work and producing more freight—seems to have been far removed from the mind of anybody who has any connection with this question.

There is some evidence quite recently that a considerable portion of the world's population is beginning to realize the necessity for applying this latter remedy, and that is the most hopeful sign on our shipping horizon.

WORLD SHIPPING

BRIEFLY stated in figures and using round numbers, there are 63,000,000 tons of shipping afloat today compared with 50,000,000 in 1914, an increase in the world's merchant tonnage of 13,000,000 tons. Under ordinary normal conditions this would represent approximately the normal rate of increase for world tonnage, and we would be in capacity for carrying freight on the same footing as we were in 1914. It is very commonplace to say that world conditions are not normal. They are so far from normal that actual figures show instead of an increase in tonnage of freight carried a tremendous decrease, so that today with 13,000,000 tons additional shipping we are carrying in the world's ships 35 per cent less freight than we were in 1914. That in a nutshell is the primal cause of all of the difficulties in world shipping.

We find a great many academical students of shipping referring to tremendous "invisible" exports depended upon by Great Britain for bringing to her somewhat of a fair balance in her export and import trades, these invisible exports largely consisting of freight earned by her sea tonnage.

Sir Frederick Lewis, chairman of Furness, Withy & Company, Limited, in his annual address to the stockholders of that great British shipping company calls attention to the fact that, while two years ago the gross freights earned by British shipping were between \$350,000,000 and \$400,000,000, the same method of calculation applied during the last fiscal year would show that these earnings had dropped to between \$60,000,000 and \$70,000,000, and that in using these figures, small as they were, for calculating the basis of invisible exports, it was necessary to deduct the coal purchased abroad during the coal strike and the joiners' work effected abroad during the joiners' strike, leaving an exceedingly small surplus to be contributed to that one-time potent adjuster of Britain's trade balance. In making public these figures, he emphasizes the fact that the \$60,000,000 to \$70,000,000 here referred to is not a profit on the operation of ocean-going shipping, but the gross returns, out of which expenses and depreciation have to be provided for, and that, consequently, a large proportion of this contribution of shipping to the invisible exports of Britain was made at a loss to the shipowning companies.

In predicting the outlook for the current year Sir Frederick speaks in parable. Says he: "A prudent traveler across the desert has his baskets full of bread and his bottles filled with water. There is no use disguising the fact that shipping has a difficult period to face, and it will take a good deal of time and patience before all our difficulties are overcome. But, to use a rowing expression, every man in the boat must pull his full weight. The principle of 'ca' canny' must be left behind as one of the specters of the past."

ONE WAY TO HELP

COUNTY COUNSEL A. J. HILL of Los Angeles has ruled that cotton stored at that point awaiting compression is subject to county taxation. He said in part: "While at the compress the cotton is not in control of the common carriers; that during the time that the cotton is in the hands of the city for the purpose of compression and not under a bill of lading, the consignee has full power of control, and disposition over it, and could withdraw the cotton and dispose of it as he might see fit; that the cotton is under control of the owner, with all the powers of absolute ownership."

The Japan Cotton Trading Company protested, in part as follows: "We hold that the cotton is not under our control and ownership while at San Pedro, by virtue of certain steamship contracts, under which we have obligated ourselves to deliver certain quantities of cotton after having same properly assembled and compressed. The necessity at times of holding certain bales at San Pedro is for the purpose of assembling a certain number of bales to meet the grade stipulations in our contracts of sale with the foreign buyers. We can show by our files that any cotton in transitory storage at San Pedro, for the purpose of assembling and compression, at noon, March 1, 1921, is not under our control for disposal as we might see fit, but that it is in transit in process of shipment, according to certain contracts of sale, which we have obligated ourselves to fulfill."

An opinion such as Mr. Hill's certainly is not likely to promote the foreign trade of Los Angeles.

ANALYSIS OF SHIPPING FIGURES

SIR FREDERICK LEWIS, chairman of Messrs. Furness Withy & Company, Ltd., makes a very shrewd and common-sense analysis of Lloyd's latest statistics and draws a very good moral for all shipping men to follow. While written from an entirely British viewpoint, the conclusions apply just as strongly on this side of the Atlantic. Without further comment we present the analysis in Sir Frederick's own words:

"I need not tell you that since we last met we have experienced a very heavy drop in freights. It is commonplace to say that this fall is due to the volume of overseas trade falling below the supply of ships, but while that is obviously the primary cause of the depression it is worth while analyzing the position somewhat more fully. A study of the statistics recently published in Lloyd's Registry of Shipping shows that of the total world's steam tonnage of 54,217,000 gross tons, there is, eliminating wooden vessels altogether, 11,703,000 gross tons of shipping afloat more than there was in 1914, notwithstanding the tonnage lost during the war. The approximate increase that would have occurred normally during this period of seven years is 15,000,000 gross tons—that is, on the assumption that there had been no war and no substantial increase in the shipbuilding plants of the United States. It will, therefore, be seen that there has been no over-production in the ordinary sense of the expression. Furthermore, these figures include a number of old vessels which, in the ordinary course of events, would have passed into the shipbreakers' hands long ago, and which have only been kept in service owing to the fact that during the war any seaworthy vessel, however old, could find employment. It is fairly safe to say that these vessels will never again be put into commission unless under exceptional circumstances, as the cost of repairs and surveys would exceed their

value when completed. Vessels on the register of over 25 years of age represent 5,757,175 gross tons, of which 4,055,847 are owned abroad and 1,701,328 are owned in the United Kingdom. If for the purposes of estimating the effective world tonnage these are disregarded, we arrive at an increase of 5,945,825 gross tons over 1914. Of this increase, however, 2,940,000 gross tons is represented by the increase in bulk oil carriers, and whilst to some extent these may displace coal carrying, for ordinary general purposes of the world's trade, it may be said there are in effect only 3,005,825 gross tons more of serviceable vessels afloat today than there were in 1914. Notwithstanding these figures there is laid up in the world's ports an amount of tonnage which was recently estimated at round about 10,000,000 tons. It follows, therefore, that the principal cause of the decline in freight is due not so much to the over-production of tonnage as to the falling off in the world's overseas trade, and so far as shipowners are concerned, I can only see one practical thing to be done, and that is to reduce operating costs to such a level as will help forward a revival of international trade. Seamen's wages have already been reduced by mutual agreement; we have extended our self-insurance arrangements in order to minimize the expenditure on insurance premiums, whilst coal has been decontrolled, and has come down in price, but still not far enough."

UNEMPLOYMENT

WE are informed by statisticians that there are at the present time several million unemployed in the United States and that the number is increasing rapidly. While some authorities are sadly perplexed over this condition, others affect an optimistic view, and even the Secretary of Labor of the United States is reported in the public prints to be not at all discouraged by the situation, stating that "there is not any more unemployment today than there was in 1914."

Much as we desire to be optimistic, however, we cannot escape the conclusion that with the present high level of prices for the necessities of life and winter coming on, these unemployed are facing considerable hardship, and the conditions are serious enough to warrant the best thought and action of the wisest heads in the nation.

President Harding and his cabinet are attacking this problem very vigorously, and under the leadership of Herbert Hoover a conference is just now being held in Washington to see what can be done toward removing the causes of unemployment. At its best, however, Federal action must be slow in reaching the great mass of men affected by this condition, and local efforts are needed to supplement those from Washington.

We suggest that these local efforts should be directed broadly along two lines. First, all available funds for public improvements should be used as promptly as possible to bridge the gap; and second, every encouragement should be given private capital so that industrial and manufacturing firms will not delay improvements to plant.

In San Francisco, for instance, John McLaren, superintendent of Golden Gate Park, comes forward with the suggestion that he can use several thousand of the city's unemployed for a month or two in park extension and improvement work, if the supervisors will vote the necessary funds.

And again, for instance, in San Francisco we know that there are some millions of cash and salable bonds

available for constructive improvement on the waterfront under the jurisdiction of the State Board of Harbor Commissioners. A very considerable amount of work in the Board's program is waiting only for the demands of business to initiate actively its program of extension. It would seem to us that there is ample argument for the immediate use of these funds and for the employment thereby of several hundreds, if not thousands, of men. In this connection the city's program for the leveling of Rincon Hill should be undertaken very promptly, as this will not only provide work for a large number of men, but will enable the Harbor Board more intelligently to initiate its program.

So much for San Francisco alone.

We know that in the region of Central California there is enough work needed to be done to provide employment for all the unemployed who reside in that territory, and that much of this work is delayed, not for lack of funds, but on account of lack of confidence in future business conditions.

Undoubtedly the same condition exists in the greater part of the United States.

If, therefore, the negotiations of the conference at Washington can restore confidence, it will take but a very short time to put all of the unemployed at work and so to create a further increase of confidence which will rapidly bring us back to stable normal conditions.

GOVERNMENT CONTRACTS

IN this connection the Federal government can immediately help the unemployment situation and at the same time go a long way toward restoring confidence in general business conditions by resuming work on its own contracts in cases where those contracts have been suspended in line with the present retrenchment program. In this particular phase of the question we are much interested because so large a proportion of the retrenchment has been directed toward marine work, both in shipbuilding affairs and naval affairs.

In the case of the suspension of the naval contracts the work had in large measure been started, commitments for materials had been made by contractors and sub-contractors in good faith, and the suspension of the contracts will in the long run simply mean that the United States government and the Navy Department will be under tremendously increased cost for the finishing of these contracts or for the satisfaction of contractors' claims against the government.

We can, therefore, see no economy in such action by the Navy Department, and we can see on the other hand that the passage by the present Congress of a deficiency appropriation to meet the work in hand under these contracts will keep at work a large number of men who would otherwise be out of employment and will go a long way toward restoring general business confidence. For purely economic reasons, therefore, we urge—and ask all our readers to urge—upon Congress that such appropriation be passed during the present session.

We believe that the Federal government in all of its departments should be very careful to maintain a high standard of business ethics. "We should have more business in politics and less politics in business."

SCIENTIFIC EMPLOYMENT SERVICE

THE engineering societies of America have recently formed a consolidated organization which is known as The Federated American Engineering Societies and represents a combined mem-

bership of about 50,000, including in its ranks the most representative and best qualified professional engineers in the United States. This federated society has undertaken a wide range of activities and has been prominently before the American people in the public prints with an educational campaign for the reduction of waste in industry.

One very useful activity of the Federated Societies, the results of which in the nature of the case cannot be given prominence, is the employment bureau which acts as a sort of clearing house for the placement of engineers of every variety of training and experience. The only qualification for service from this bureau is that all applicants must be members of one of the affiliated societies and must submit a complete educational and professional record of their engineering experience. These records are carefully classified and collated, and as inquiries for men to fill positions are received, the records of men suitable to fill them are immediately available. The services of the bureau are free to employer and member alike, and all negotiations must be strictly confidential, is desired.

The high standards required for membership in any of the member societies insure the quality of the men available, while the number and the varied experience of the members of these societies provide a wide field of choice for a prospective employer.

The employment bureau of The Federated American Engineering Societies tenders its services to all engineering organizations in the building up and expansion of their personnel in preparation for the increased activity which is now manifest in the majority of our industrial centers.

A HEARTY ENDORSEMENT

WHEN H. H. Ebey, district director of operations of the Shipping Board, returned from Washington to San Francisco still seated securely in the saddle, the unusually active rumor that he was to be supplanted more or less summarily died a sudden death. Something doubtless occurred at Washington of which the public has no precise idea, for the prophecies of Mr. Ebey's forced retirement were too circumstantial to have been groundless, and many well-informed individuals thought that he was bound for decapitation. What caused the Shipping Board, or certain members thereof, to decide otherwise also may be left to speculation, but the following statement of the attitude of the Pacific American Steamship Association may have had some effect:

"In view of press reports of extensive reorganization within the board and having been in close personal contact with the situation here, we take the liberty of calling to your attention the efficient service rendered the Shipping Board and the splendid co-operation afforded your managing agents and private operators by Harold H. Ebey, district director of operations, and his assistants. We strongly indorse his administration and trust that your board and officials will see your way clear to its continuance."

The telegram was signed by the following: Matson Navigation Company, Williams, Dimond & Company, Pacific Steamship Company, McCormick & McPherson, Robert Dollar Company, Struthers & Dixon, Pacific Mail Steamship Company, Sudden & Christensen, W. R. Grace & Company, Swayne & Hoyt, E. C. Evans & Sons, Oceanic Steamship Company, General Steamship Corporation.



JOSEPH E. SHEEDY

NEW EUROPEAN MANAGER U. S. SHIPPING BOARD

IF Honolulu should preen its feathers with undue care these days the purely terrestrial world doubtless will cast a tolerant eye on the Paradise of the Pacific. Another former resident of the Hawaiian metropolis has climbed high in the world of shipping. This time it is Joseph E. Sheedy, former general superintendent of the Inter-Island Steam Navigation Company, who has become European manager of the Shipping Board with full powers. Captain Frank E. Ferris, special commissioner with offices in London, and his entire organization will report to Mr. Sheedy. There will be an immediate reduction and Americanization of the European staff.

Coast Guard Officer

As an officer of the Coast Guard (then the Revenue Cutter service), Mr. Sheedy had training and experience practically identical with those of Annapolis graduates. He served with success as general superintendent of the Inter-Island Company, Honolulu; and late in 1916 became general manager of the Seattle North Pacific Shipbuilding Company. His first vessel, built during the rush of war-time, was launched within 84 days from the laying of the keel, the second within 89 and the third within 81. The first record was 42 days better than anyone had done prior to that time, the second 37 and the third 35, all of which indicates that Mr. Sheedy had built up a remarkable organization.

From the Seattle North Pacific yard he went to Seattle Construction & Drydock Company as assistant to the president and then was made manager of the Downey Shipyards Corporation, Staten Island, New York. While on the Atlantic he became a member of the United States government (Atlantic Coast) committee on bulkheads and freeboard, member of the

technical committee of the American Bureau of Shipping, member of the planning and control committee of the Atlantic Coast Shipbuilders' Association, and also was connected with the Council of American Shipbuilders.

Also a Honolulu

Captain Ferris also is a former resident of Honolulu, having been there while Mr. Sheedy was with the Inter-Island. Their offices were so close together that a husky boy could have tossed a green coconut from one to the other. After serving as San Francisco superintendent of the Pacific Steamship Company and marine superintendent of the Union Oil Company of California, Captain Ferris, because of ill-health, went to Honolulu to take command of the British steamship *Kestrel*, which plied between Honolulu, Fanning Island and the Gilberts. He joined the Naval Reserve early in 1917 and became censor of cables at Honolulu; when the Dutch steamship *Ophir* was commandeered he took her to the Atlantic, where he served as commander of convoy. At the end of the war he became chief inspector of construction and repairs, South Atlantic District, Shipping Board, with headquarters at Jacksonville; from that position he went to the New York District as managing agent; and after a few months in private business became European special commissioner of the Shipping Board with headquarters in London.

The I Knew Him When Club of Honolulu doubtless will be holding some business sessions at Fort and Merchant streets, on the shady side of the Bank of Hawaii.

ANNOUNCEMENT

NATHAN J. GLASS, formerly vice-president and general manager with George E. Butler, for twenty-five years connected with that firm and for the last three years in entire charge of its business, has established independent connections and is now located at 250 California street with a very fine line of the highest grade nautical instruments, chronometers, watches and clocks.

A beautifully equipped repair shop will be maintained, extending to the marine trade of the Pacific Coast the highest type of facilities for the adjustment and reconditioning of ships' clocks and navigating instruments.

"Nate" Glass, as he is familiarly known along the waterfront, needs no introduction to the marine fraternity of San Francisco harbor. We extend to him our congratulations and our best wishes for his success in this new venture.



SAFETY AT SEA

TO the ordinary layman the idea of a sea voyage immediately brings some thought of danger, hardship, exposure, if not actually of the cast-away-on-a-desert-island or cannibal stories which so often are associated with the sea in popular fiction, the "movies" and the daily press. It is rather curious that this idea should still prevail, especially in view of the fact that the majority of the people of America have what might be termed "sea blood" in their veins, but that the idea does prevail to a very great extent is shown conclusively by the manner in which the public press of America treats any opportunity to capitalize marine disasters.

Rather curious, too, is the popular idea that the sailorman who fails to become an actual hero in time of such disaster has something lacking—the captain is expected to go down with the ship, and every common sailor is expected to perform efficiently with coolness and daring tasks, which in many instances are absolutely impossible as far as any human agency is concerned.

No such ideas are prevalent in the popular mind with regard to any other mode of travel. Note that the heading under this article is "Safety at Sea" and not "Danger at Sea." Statistics show beyond any reasonable doubt that sea travel per passenger carried has less proportion of mishap to the life and limb of those passengers than any other mode of travel known on the face of the globe. Yet it is a phenomenon noticed by all steamship companies that after any prominent marine disaster there is a very decided falling off of applications for bookings and a very marked cancellation of bookings already made for all passenger steamers.

Much material published in the press recently has attributed to the mania for speed the danger to navigation along our coasts and in the North Atlantic, notwithstanding the fact that both on the Pacific Coast and in the North Atlantic ferry passage the companies which hold the record for speed are those most free from trouble. The Cunard Steamship Company, which holds the trans-Atlantic record, very proudly and truly boasts that for over fifty years it has not lost a life of a passenger at sea through ordinary marine mishap. Many lives were lost from the liners of this company through war risks in the

late war, but that of course is a very exceptional condition which does not count in the present discussion.

A great deal of the treatment of recent disasters in the public press has emphasized the idea that much of the danger was due to the instructions issued by operating companies to their captains to make the schedule at all costs. This propaganda in the daily press is nothing short of libelous. It is a well known fact that practically all of the operators of passenger vessels issue instructions to their commanding officers which are directly in opposition to any such ideas. In proof of this we would like here to quote a letter written April 25 last by A. J. Frey, then general manager of the Los Angeles Steamship Company and now vice-president in charge of physical operations of the Emergency Fleet Corporation of the United States Shipping Board. Mr. Frey's letter is addressed to the commanding officers of the Yale and Harvard, and to them he says:

"I cannot too strongly impress upon you that the vessel under your command is at all times to be navigated with caution and in a manner which will safeguard the lives of the passengers and crew, and the property placed under your charge. While it is desirable to make the advertised schedule of eighteen hours between Los Angeles harbor and San Francisco, you will clearly understand that this is only expected when weather conditions will permit of such schedule with safety, and that at no time are you to take any undue risks with the vessel under your command."

This letter is typical of the general instructions issued by the managers of steamship companies to the officers on shipboard.

Probably no subject connected with marine activities has been given greater consideration than the design, construction and equipment of passenger ships for greater safety in sea voyages. The British and United States patent offices are full of patented ideas with regard to new forms of construction, apparatus for working lifeboats, new forms of lifeboats, life rafts and life preservers, and the maritime laws of all maritime countries in the world are full of statute provisions for the inspection and equipment of passenger vessels to insure the safety of the passengers. International confer-

ences have been held on this subject, and a tremendous amount of material is available for those who are fond of research.

The coming of wireless telegraphy introduced a new era in passenger travel at sea. Today practically every passenger vessel is equipped with wireless apparatus. Practically the entire coast line of the United States, at least, is equipped with wireless stations of sufficient power and sufficiently close together so that a coasting vessel or any offshore vessel approaching the coast can in any condition of wind or weather almost instantly ascertain her true position by means of wireless.

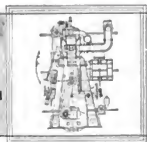
As an auxiliary to this service and to insure the greater efficiency of our aids to navigation, every lightship and every lighthouse should be equipped with automatic wireless sets for sending out characteristic signals so that the wireless apparatus on any vessel in times of fog could easily pick up the position of these warnings of dangerous points.

Another form of equipment, which has not come into very general use on American ships but which is now being installed on practically all new passenger liners building in Europe, is an auxiliary Diesel or gas engine generating set located on one of the upper decks and sufficiently powerful to provide current for all of the deck and stateroom lights of the ship and for the operation of the steering gear, deck winches and anchor windlass. Such an installation in the case of flooded engine or boiler rooms could be instantly put into operation and might be at any time the means of saving the ship, and certainly would be in case of a night disaster the means of preserving the morale of the passengers and crew so as to make possible a very much more efficient working of boats and other life saving apparatus than would otherwise be the case.

We have here a very strong travel. We have here a very strong case because not only can we prove by statistics that travel by sea is the safest mode of travel, but we can also show that, notwithstanding that proven safety, the marine engineer, the naval architect, and all the law makers of maritime countries are constantly at work making this safest mode of travel more safe and more comfortable for the enjoyment of all passengers on our sea lanes.



Oil Engines and Motorships



PROGRESS IN MOTORSHIP BUILDING

THE figures for mercantile motorships shown in Lloyd's latest register indicate the remarkable growth of the motorship idea. There are now in service 1447 motorships aggregating 1,263,000 tons gross. This figure does not seem very impressive when compared with the total merchant tonnage of the world—62,000,000 tons gross—of which it represents slightly over 2 per cent. It is only when the total for 1921 is compared with that for 1913 that the true significance of the figures is realized.

In the latter year there were in service only 290 vessels totaling 234,000 tons; in other words, in eight years the motorships in service have been increased by 600 per cent. Including motorships under construction, the grand total now reaches an aggregate of nearly 2,000,000 tons gross, and in judging these figures it must be considered that four out of these eight years were so abnormal, especially in relation to shipbuilding and marine problems generally, that they can hardly be considered. They really should be dropped out of the record. It might be said on a close analysis of these figures that during the past three years motorship building and the idea of the motorship as the most economical cargo carrier has advanced well over 1000 per cent; in fact, the only freighter ordered in Great Britain during the last five months is a Diesel driven motorship.

Bearing all this in mind, it is hard to understand why the United States Shipping Board does not more actively follow up the idea of converting many of its already antiquated new steamers into economical motorships.

In this connection we would invite our readers' attention to the suggested design reproduced on another page of this issue for the conversion of the standard Hog Island type of freighter from steam turbine drive to Diesel electric drive.

American manufacturers of Diesel engines should be turning their attention very seriously to the prob-

lem of designing oil engine plants for conversion work in the Shipping Board's great fleet of steamers. The great majority of these steamers is of the single screw, slow speed propeller type, running from 80 to 100 revolutions, the plants ranging from 1500 to 3000 H. P. There certainly should be no very great difficulty in meeting these conditions with a Diesel engine plant along any one of three lines: ordinary, straight, non-reversible Diesel engines connected to propeller shaft through hydraulic or mechanical gearing; Diesel electric drive; and, for some of the ships at least, directly connected, directly reversible Diesels of the long stroke, slow speed marine type.

In the present condition of the world's shipping market and of the world's foreign trading, it is not conceivable that there will be any very great demand for new ships, but it is very probable that there will be a large demand for a well designed, easily installed internal combustion engine plant for the conversion of freight steamers into more economical motorships. Practically all of the more experienced Diesel engine builders and shipbuilders of Europe are very busy just now on this problem, and our American shipbuilders have a great opportunity to prove that American ingenuity is still in the forefront in the design and erection of propelling machinery.

Prospects of a Revival

There can scarcely be any doubt that a small improvement has been noticed in European shipping circles during the past month or two and the number of vessels laid up has perceptibly diminished. What is, however, more important is the fact that after a period of complete stagnation one or two orders are now being placed by shipowners who see the possibility of returning prosperity and do not wish to be caught with insufficient tonnage when this happy state of affairs comes into existence. In all cases, however, the orders are for motorships, and it is now generally agreed that there will

be a boom in motorship construction so soon as conditions return to anything like the normal.

Mr. Fred Olsen, the Norwegian shipowner whose name is well known on both sides of the Atlantic and who controls a large number of shipbuilding and shipowning companies in Scandinavia, has just placed an order for a 7000-ton motor cargo ship and has moreover given instructions for work on it to proceed with the utmost speed. This contract is of all the more significance when it is remembered that Mr. Olsen's ships trade to every part of the world, and his understanding of shipping prospects is probably at least as good as that of any other shipowner. Moreover he already has about half a dozen motorships building in various countries, and in his fleet seven or eight similar vessels are in regular service.

Another new order for a motorship that has just been placed is that which Hunting & Sons of Newcastle have just given to the Tyne Iron Shipbuilding Company, the machinery to be built by the North-eastern Marine Engineering Company, who have the license to manufacture Werkspoor Diesel engines. This vessel is of 10,350 tons with a length of 365 feet and will be equipped with a couple of engines totaling 2400 i. h. p. A third order for a motor vessel has been placed in Italy with the well known Ansaldo Company for a standard 8100-ton motorship equipped with two-cycle machinery of 2200 b. h. p., this new contract being to the order of the Roma Steamship Company. In the meantime there is no sign of any contracts for steamers being fixed, and on the whole, the prospects for rapid motorship developments in Europe are as bright as they have ever been, although it is obvious that no very great progress can be made until there is a general improvement in trade conditions.

Double Acting Engines

It has been assumed by some people that the future of the marine Diesel engine lies with the single

acting type operating either on the two-cycle or four-cycle principle and that little is likely to be heard of the double acting engine. There are now grounds for believing that this is an incorrect view. In Germany there is still a strong body of opinion in favor of the double acting machine, and the confidence which is placed in this design is instanced by the order which the Hamburg Line have passed to the well known German shipbuilders, Blohm & Voss, for no fewer than eight cargo motorships of about 6000 tons, in each of which, it is stated, double acting Diesel machinery will be installed.

The advantage which is claimed for this class of plant is that the cost of construction is reduced, the weight and space occupied are less than with corresponding single acting engines, while the fuel consumption, although necessarily somewhat higher, shows comparatively little increase in view of the advantages enumerated. It cannot be said that the builders are without experience in this work, as they commenced the construction of their first double acting engine about 1911, and although only one ship is now in service fitted with Blohm & Voss engines, this has proved extremely successful and is now sailing under the British flag.

In Great Britain there is also some belief in the double acting type, and the North British Diesel Engine Works, which is now building a large number of four-cycle engines for installation in cargo and passenger vessels, has just developed its first double acting Diesel engine and carried out satisfactory tests. It will not be in the least surprising if, in the course of the next few years, some very important developments are made in connection with double acting motors, more particularly in their construction in very high powers for installation in big trans-Atlantic liners. The idea of obtaining two power strokes per revolution is obviously attractive, and if it can be carried into effect without any corresponding disadvantages it must ultimately make great headway. On the other hand, it must be remembered that the manufacturers of the single acting Camellaird Fullagar engine claim that they can build their motors actually smaller in dimensions and lower in weight than corresponding double acting engines, so that they are likely to see some interesting competition between various designs in the near future.

14,000-ton Motorship for the R. M. S. P. Co.

The number of important British shipowning concerns who have

neither motorships on order nor in service is becoming steadily less, and the latest firm for which a first motorship has just been launched is the Royal Mail Steam Packet Company, which is, of course, one of the largest shipowning combinations in Great Britain. Few developments are more interesting in connection with oil engined vessels than the fact that competing shipowning firms are ordering ships of exactly similar dimensions and with similar machinery installations. The new boat for the Royal Mail Steam Packet Company, which has been named *Loch Katrine* is a sister ship to four built for the Glen Line, while three others are under construction, two for the Holland America Line and one for the Elder Dempster Company.

With the exception of the *Loch Katrine*, all of these are being built by Harland & Wolff, but this ship has been constructed by John Brown & Company, the famous Clydebank firm, to Harland & Wolff's design. We have thus reached a degree of standardization both in shipbuilding and shipowning that has never previously been recorded in normal times in connection with steamers. The advantages of such a policy are obvious since the shipowners obtain a vessel which they know from previous performance of similar craft is eminently reliable and economical and about which there are no uncertain factors.

The machinery for the *Loch Katrine* is being built by Harland & Wolff, and comprises a couple of their standard 3200 i. h. p., eight-cylinder sets, the largest engines of this class now being built. This type of machinery has already proved a success in connection with the Glen Line boats, and ships of the *Loch Katrine* class, carrying 14,000 tons of cargo at an average speed of approximately 12½ to 13 knots, consumed only 20 tons of oil fuel compared with 80 tons of coal on a corresponding steamer, or 50 tons of oil on a vessel fitted with oil-fired boilers.

Such a difference in consumption is too great to be ignored, and there are indications that many of the other large British shipowners will shortly place orders for similar craft which have proved so eminently suitable for general cargo carrying, especially on long voyages. The *Loch Katrine* is 502 feet in length with a beam of 62 feet, and among the features which render her interesting to shipowners generally is the exclusive adoption of electricity for all purposes. This is, in fact, one of the newer marine developments coincident with the coming of the oil-engined craft, and although it is

freely admitted that electrical machinery costs more than steam plant, the economy in operation is extremely large. In actual comparisons with corresponding ships it has been found that to run the electrical auxiliaries on a motorship costs between one-sixth and one-eighth the amount expended on a steamer when steam auxiliaries are utilized.

New Sulzer Installation

The completion of the first large British ship equipped with Sulzer Diesel machinery is noteworthy, this vessel being the *Conde de Churrua*, which ran her trials at the end of August from Armstrong's yard on the Tyne. She has been constructed to the order of a well known Spanish firm and is a tanker 370 feet in length with a cargo carrying capacity of 6500 tons. The speed is higher than is normally associated with tank vessels, and two engines, each of 1250 b. h. p., are fitted, giving an average speed at sea of 11½ knots.

Top Platform Control

Several features of interest are to be noted in these motors. In the first place, an entire departure has been made in the control arrangement and the control station is arranged at the top of the engines instead of below, thus avoiding a great deal of gear which has normally to be provided, connecting the control wheel with the valve operating mechanism. It is claimed that, as most of the vulnerable parts of a Diesel engine are at the top, it is only logical that the control should be effected from this point, and there is a good deal to be said for this view. Each engine drives its own scavenging pump and air compressor, and by the elimination of scavenging valves, the number of valves in the cylinder cover is limited to one fuel valve, one starting valve and a relief valve. The fuel and starting valves are arranged in the same cage, so that actually only one large hole has to be drilled in the cylinder cover, thus minimizing the possibility of cylinder cover cracks developing. In the larger types of Sulzer engines, scavenging air is provided from separate electrically driven turbo blowers, but this system has not been employed on the new ship, as it is considered more suitable for engines of 1500 b. h. p. and over.

The largest vessel of any sort ever built in Norway is now approaching completion at the Rosenberg Mek Verksted at Stavanger and this is a motorship of 9000 tons deadweight. In the *Handicap*, as the new craft is named, a couple of 1350 b. h. p. Sulzer Diesel engines have been installed, supplied by Sulzer Brothers at Winterthur in Switzerland.

MOTOR SHIPBUILDING IN GERMANY

Vessels Totalling 175,000 Tons Under Construction

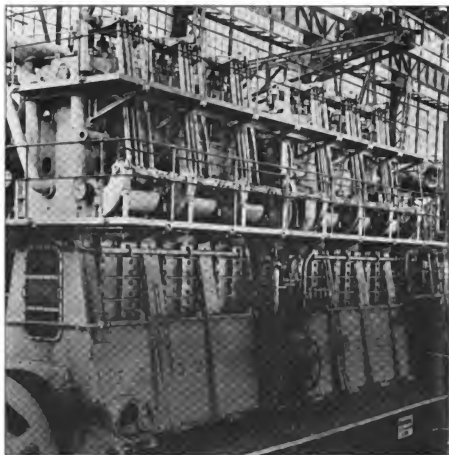
By R. Z. DICKIE

ACCORDING to the recently issued report of the Deutsche Werft A. G. of Hamburg, which is now the largest shipbuilding concern in Germany, although only established in 1918, contracts are in hand for ten motorships of about 61,000 tons, with 26,000 horsepower. It is of some significance as indicating the working of the minds of German shipowners that a note is added to the report to the effect that, in spite of the existing depression, "it is certain that in the last few weeks there has been a new demand for special types of construction, such as tankers and motorships." The contracts which the company has in hand insure full employment of the works at least until the middle of 1922. It will be remembered that the Deutsche Werft was established in connection with other large industrial concerns, and the machinery for the motorships now under construction is being built at the A. E. G. Berlin works.

The increasing number of orders that are being placed in Germany for motorships confirms the belief that the new German mercantile fleet will be built up largely of internal combustion engine craft. The full extent to which such vessels are being constructed in Germany is not known, but the list given here, which is believed to be correct, gives details of some of the boats of this class which are now on the stocks. These comprise a total of twenty-five vessels, with a deadweight tonnage of 175,000, propelled by machinery totaling 72,000 horsepower. It is probable that this considerably underestimates the work which is being carried out, for it is understood that at Blohm & Voss' yard very important developments are anticipated in the construction of motorships equipped with double-acting Diesel engines of the Blohm & Voss type.

Reduction Gears

In connection with the two motor vessels being built by Blohm & Voss



A Burmeister and Wain type 6-cylinder directly reversible marine Diesel engine as built by the A. E. G. Works at Berlin

for the Hamburg-Amerika Line, an interesting departure has been made which will be watched in Europe with considerable interest—that is, in each vessel will be installed two 3000 B. H. P. Diesel engines which were built at the Augsburg works of the M. A. N. and were originally intended for installation in submarine cruisers. The engines have ten cylinders and run at 390 r. p. m. and are of the four-cycle design with a high mean effective pressure of 100 pounds per square inch.

These engines will be equipped with reduction gear, reducing the propeller speed to about 100 r. p. m. and the speed of the boats will be

from 13 to 14 knots.

On the Pacific Coast where it is believed this idea was first used it proved very successful, as the motorship Libby Maine, which is engined with two 320 horsepower Dow-Wilans engines fitted with reduction gear, has been in operation several years with complete satisfaction.

German Competition

From the above statistics it will be seen that Germany will be an important competitor in marine circles in a very short time, as it will invest its new capital in motorships of the latest design, while other countries have fleets of steam vessels on hand which are rapidly becoming obsolete.

No. of Ships	Builders	Owners	Total D. W. Tonnage	Total H. P. of Machinery
8	Hamburg-Amerika Line	Hamburg-Amerika Line	48,000	20,000
10	Deutsche Werft, Hamburg	Hamburg-Amerika Line	61,000	26,000
2	A. G. Krupp, Kiel	Stinnes	6,000	2,800
1	Howaldtwerke, Kiel	Hamburg-Sud Amerika Line	14,000	5,000
1	A. G. Weser	Hansa Line	9,000	3,200
2	Blohm & Voss, Hamburg	Hamburg-Amerika Line	28,000	12,000
1	Tecklenborg	Hansa Line	9,000	3,000
25			175,000	72,000

FROM STEAM TURBINE TO DIESEL ELECTRIC

A Plan for the Conversion of Class "A" U. S. Emergency Fleet Corporation Ships

By JOHN L. BOGERT

IN the year 1911 were completed three motorships, the Selandia, Jutlandia and Christian X, that were destined to revolutionize the shipping industry. Ten years of steady, uninterrupted service find them still in excellent condition, just as economical of fuel in 1921 as in 1911; 500,000 sea miles of voyaging in the seven seas in all kinds of weather under various conditions of loading have demonstrated their economy in upkeep cost.

Denmark has every reason to be proud of the East Asiatic Company, who ordered them built, and of Burmeister & Wain, who designed and built their machinery. These ships are 370 feet by 53 feet by 30 feet, and can carry 7400 tons of deadweight on 23 feet 6 inches draft. Their twin Diesel engines of eight cylinders each were designed to operate at 140 r. p. m. and develop 1050 B. H. P. each at that speed, propelling the fully loaded vessel at 11 knots. In service the r. p. m. are usually about 126.

The Christian X was sold to the Hamburg American Line at the time of her acceptance trial, but the Selandia and Jutlandia have consistently earned large dividends for their original owners, and during this recent slump in freight rates have continued in regular service, while a large part of the world's steam tonnage has been laid up.

During the war the United States Emergency Fleet Corporation laid down a great many ships of this size in the shipyards of the country, no less than sixty being ordered at one time from the Hog Island plant alone. While of practically the same size as the Selandia and Jutlandia, they differed in that they were single-screw instead of twin-screw ships, and unfortunately they were all steam engine driven, not one of this immense fleet of 7500-ton ships being equipped with Diesel engines.

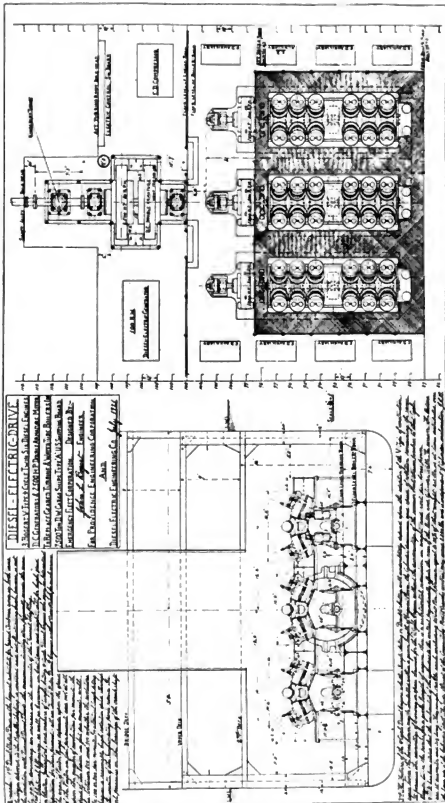
To the United States tax-payer, learning that such ships when motor-driven are capable of 60 per cent increased earnings over the same size steamship, comes the question, is it not possible and practical to replace the steam machinery of these steamers with some form of Diesel engine. The answer is that it is both possible and practical.

The writer of this article has spent considerable time on this problem and, thanks to the courtesy of

the Pacific Marine Review, is able to show by means of the accompanying drawings one thoroughly practical way of making the con-

version of any of the Class "A" Emergency Fleet Corporation steamers into first-class motorships.

The vast majority of these Class



Proposed arrangement of Diesel electric drive for the conversion of United States Shipping Board standard 7400-ton deadweight Class A Hog Island steam freighters

"A" ships was propelled by steam turbines operating on the propeller-shaft through gearing, and it is one of the characteristics of the turbine that its torque is constant. Such, however, is not the case with the Diesel engines of the Selandia and Jutlandia. Their torque is a fluctuating one. This factor in the problem is an important one. A propeller or tunnel shaft that was abundantly strong enough to transmit 2500 shaft horse power from a turbine through gearing might fail when called upon to transmit the same amount of horse power at the same number of revolutions per minute coupled direct to either a six or eight cylinder Diesel engine similar to those that drive the Selandia and Jutlandia.

This means that the conversion of Class "A" Emergency Fleet Corporation ships by the substitution of direct-connected 4-cycle Diesel engines for the watertube boilers, turbines and reduction gearing might easily necessitate a change in the diameter of the propeller and tunnel shafting, and with that change a change likewise in the stern-frame to permit a larger stern-tube. If, however, the Diesel electric drive be adopted, no such problem will be

faced. In the case of the electric drive the torque of the motor is not fluctuating but constant; it is similar in its uniformity of drive to the turbine.

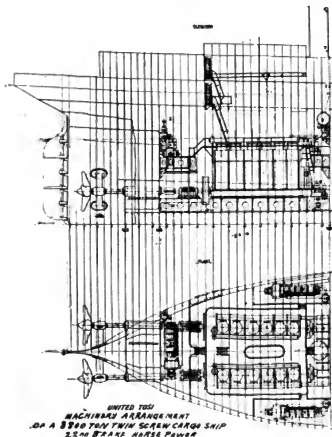
To make this manner of conversion clear to the naval architect, marine engineer and ship owner, accurate scale drawings are herewith shown. The fluctuating changes in torque of the Diesel engines shown are all absorbed by the fly wheels and transmuted by the direct-connected electric generators into a uniform D. C. electric current. As a matter of fact, these conversion drawings show a power house such as might be erected anywhere on land. The space available dictated the form of Diesel engine selected, since the fore and aft space was limited by the position of the forward boiler room and aft engine room bulkheads. Because the V-type of engine permits double the horse power in the same length fore and aft, the size of cylinders and number of turns per minute being the same, that kind of Diesel engine appeared to be indicated by the conditions of the problem.

Three generating units are shown. In the opinion of the writer, for such cargo ships, the choice will

ultimately fall between the adoption of two units or three. He fails to see any benefit to be derived from a larger number of direct-connected units, either with the same number of cylinders per engine but of smaller bore, or of larger bore but fewer in number per engine. Many engineers will undoubtedly cast their vote for but two Diesel engines with their direct-connected electric generators. Such a change, since it will necessitate larger cylinders, will call for a longer engine and a longer electric generator. The speed of rotation will be necessarily lower, which means a heavier engine and a heavier generator. There would be a gain, however, in the thwartship space occupied.

The solution of this problem of the conversion of the Class "A" Emergency Fleet Corporation ships from steam to Diesel engine power appears to call for the adoption of either two or three Diesel engine driven electric generators furnishing electricity to a double armature D. C. electric motor direct connected to the tunnel shafting and normally operating at a speed of 80 turns per minute.

CONVERSION PLAN FOR 8800-TONNERS



The accompanying drawing shows an arrangement of machinery in the stern of a standard 8800-ton twin screw cargo ship. This layout is for two Tosi directly connected directly reversible marine oil engines of the true Diesel type, each engine developing 1100 B.H.P. There is going to be a great demand for conversion jobs such as that illustrated here, and American manufacturers of Diesel engines should be preparing for this demand by familiarizing their engineering staffs with all of the problems involved in making such an installation in our standard ships with a minimum alteration of the hull structure. The problem of conversion will be largely a problem of first cost, and it is up to the designer and manufacturer of Diesel engines to give the American shipowner a simple unit which can be installed in place of the present reciprocating or turbine steam plant.

That some firms are busy on this job is shown by the two arrangements of machinery illustrated in this issue of Pacific Marine Review. The Tosi directly reversible marine oil engine is manufactured in San Francisco by the United Engineering Company, whose long experience in Pacific Coast commercial operating conditions enables them to thoroughly appreciate all of the nice adjustment between the hull structure and the propelling mechanism that are so necessary to the success of a marine power plant installation.

AN INTERESTING MOTORSHIP

Royal Mail Steam Packet Eliminating the Steam

CONSIDERABLE interest was displayed by San Francisco shipping men in the recent visit to this harbor of the fine new motorship *Somersetshire*, which is being operated by the Royal Mail Steam Packet Company under charter from the Bibby Line.

The *Somersetshire* has been described at some length in the motorship building notes in previous issues of *Pacific Marine Review*. She has a capacity of 12,000 tons deadweight on 28 feet draft, is 470 feet long, with 57 feet beam and a molded depth of 37 feet. She was built by Harland and Wolff at Belfast and engined by them with Burmeister and Wain type Diesel engines of the Harland and Wolff improved design. While on the coast at Puget Sound ports and at San Francisco she booked several passengers for the trip to Europe via the Panama Canal, having accommodations for twelve passengers in very nicely appointed quarters in her superstructure amidships. The fuel tanks of the *Somersetshire* have a capacity sufficient for a voyage of 45,000 miles under full load condition.

The Royal Mail Steam Packet Company have on order and under construction in British shipyards six motorships for the United Kingdom-North Pacific service, all of which will be very similar in most respects to the *Somersetshire*, an exception being that they will be fitted with a large amount of refrigerator space. Three of these vessels, the *Loch Katrine*, *Loch Goll* and *Loch*



View of the new McFarlane winches on the British motorship *Somersetshire*

Monar, are now nearing completion and will go on berth as soon as they are outfitted.

One feature of the *Somersetshire*'s equipment which attracted a great deal of favorable comment, especially from stevedores in San Francisco and Vancouver, was the new McFarlane system for deck winches for cargo handling. As will be seen in the illustration, this system provides for from one to any practicable number of winches mounted on a single shaft and connected thereto by suitable planetary spur gearing, the shaft itself being driven by worm drive from a single electric motor and power being transmitted to the individual winch drum by

the use of brake bands on the housing of the planetary gear. This system has been found to work out admirably in the handling of mixed cargoes and is being installed on many British motorships.

The Royal Mail Steam Packet Company are agents in Seattle for the Holland-America Line. Their active organization has enabled that line to obtain a goodly share of the shipment of Northwestern apples and other agricultural products to Europe, and it is well worthy of note by American companies that this strong British line is installing such a large proportion of refrigeration space in its new carriers.



The motorship *Somersetshire* at a Puget Sound port, 12,000 tons capacity at 28 feet draft

EUROPEAN MARINE NOTES

Impressions of a Californian in Britain

ALTHOUGH the latest returns of Lloyd's show the United Kingdom to be the leaders in world shipbuilding, they do not bring any comfort to the mind of the British shipbuilder.

The figures are exceedingly interesting and well worth while analyzing by all who are interested in shipping and shipbuilding. The tonnage now afloat consists of 33,206 vessels aggregating nearly 62,000,000 tons. In the shipyards of the United Kingdom merchant shipping under construction is nominally 3,500,000 tons and in the shipyards of the balance of the world, including the United States, the tonnage under construction aggregates 2,500,000; in other words, we have under construction and afloat 68,000,000 tons of merchant shipping.

More Ships—Less Freight

Before the war the tonnage of the world aggregated less than 50,000,000 tons, and under the present depressed trade conditions the marine freight tonnage of the world, according to the best authorities, seems to aggregate from 30 to 40 per cent less than the amount that was carried by water in 1914. In other words, we have now afloat and under construction 35 per cent more tonnage than we had in 1914 and probably 35 per cent less freight to carry in that tonnage.

Under those conditions it is not at all surprising that ordinary freighters should be a drag on the market and that only the most experienced and long established shipping companies have any chance at competition in the carriage of the world's freight by sea. Everywhere in Britain the question of the causes of the present stagnation in shipping is discussed, and the almost universal answer seems to be—high costs of coal, steel and labor, and internal disturbances in Russia and Asia.

In the matter of coal there has been a very decided improvement since the settling of the labor troubles of the coal miners, and a marked improvement in the volume of export was shown during July. Comparative figures for exports of steel throw an interesting light on the lack of bulk cargo.

Cheaper Coal Needed

The Monmouthshire and South Wales Coal Owners' Association has published some very interesting figures on the present condition of the coal industry in Great Britain. Total shipments of coal from the

This installment of "European Marine Notes" marks the beginning of a series of comments by a California marine engineer on conditions as he finds them in Europe and especially in Great Britain.

There has been a considerable amount of material in the public press of America and in certain marine and other trade journals concerning British propaganda in the United States and British efforts to strangle the American merchant marine. There can be no doubt in the mind of anyone who knows the situation that Great Britain is straining her every resource to retain her place as the greatest merchant marine carrier in the world, and it is perfectly right and proper that she should do so.

We in the United States should be watching this struggle with great interest, particularly as we own so many merchant marine vessels ourselves.

The purpose of these European marine notes is to keep the readers of Pacific Marine Review informed as to the trend of events in European shipping and shipbuilding so that we can the more intelligently shape American marine policies to meet European competition.

Any suggestions or questions from our readers will be gladly received.

United Kingdom in 1913 were, using round figures, 97,000,000 tons. In 1920 this amount had decreased to 40,000,000 tons. During the same time the United States' exports of coal increased from 4,500,000 to 22,000,000 tons. The total output of coal for the United Kingdom during the last two years has been at the rate of 230,000,000 tons per annum, a decrease of 67,000,000 tons when compared with the output for 1913. In the seven months just prior to the war Great Britain exported 42,500,000 tons of coal. In the same seven months of 1921 Great Britain's exports amounted to only 6,841,000 tons.

Great Britain has just as many mines and more miners, more docks and more ships than she had before the war. Steel, which largely depends upon coal in its manufacture,

has dropped in export tonnage from 3,000,000 in the seven months just before the war to considerably less than 1,000,000 in the first seven months of 1921. Great Britain's capacity for the manufacture of steel has increased 50 per cent as far as plant is concerned. Only about one-sixth of the available plant is working today.

Labor Blamed

The blame for this state of affairs is laid mainly to the high cost of unit production, to low output, and high cost of labor. To put it very tersely, in the United States 500,000 miners produce 500,000,000 tons of coal a year, while in the United Kingdom over 1,000,000 miners are producing about 200,000,000 tons. The United States' output averages 20 tons per man per week. The British output is less than 4 tons per man per week. This is, of course, largely due to unfavorable natural conditions in the very deep mines of Britain and favorable natural conditions in American mines, but taking all of these things into consideration, the British mine owners feel that the British rate should be about one-half the American rate instead of, as shown, one-fifth.

American Competition

A generation ago the American rate was slightly under 8 tons per man per week and the British rate 6 tons per man per week. In 1913-14 the pit mouth cost of coal in Britain was about 10/- per ton, 7/- of this being absorbed in miners' wages. In the first quarter of 1921 miners' wages absorbed very nearly 30/- per ton. Wages to the miner had not increased in this proportion, but the reduced output per man placed this burden against the ton of coal. Today after the recent reduction in miners' wages, a ton of British coal is costing for pit labor alone 25/- at the pit mouth as against a little under 7/- comparable cost in the United States.

What is needed is increased output per man, and the conclusion of this report of the Monmouthshire and South Wales Coal Owners' Association is that about one-half of the miners now employed in British coal mines should be diverted to other labor and the output per week per man doubled.

Steamers Laid Up

There are at the present time over 100 steamers laid up on the Humber and more than 200 on the Tyne, a total tonnage of over one million and a half, and a corresponding

number in other British ports, with a consequent almost unparalleled slump in freight rates and in the value of ordinary freight steamers.

The official statistics relating to traffic from principal ports of the United Kingdom show total arrivals for the month of June, 1921, 6,596,000 tons, total departures 6,500,000 tons. In 1920 these figures were, respectively, for June, 10,177,000 tons and 10,600,000 tons. It is figured that the practical stoppage of coal exports accounts for about 2,300,000 tons of the year's decrease in export tonnage. It will be borne in mind that the total figures given above represent domestic as well as export and import trade.

Vessels are being run to Australian and South American ports practically in ballast, bringing home grain cargoes at low rates, and taking a loss of from £20,000 to £30,000 on the round trip.

Joiners Strike Over

One cheerful note comes in the ending of the ship joiners' strike, making it possible for many of the ships now on the ways, which had been delayed, to be rushed to completion. It has been a very sore point with the British merchant, the ship owner, and the shipbuilder that so many of Britain's ships have on account of this strike had to be finished in continental yards, a notable example having been recently the splendid new Cunard liner *Scythia*, just now on her maiden voyage to New York. The ship joiners have been out for between eight and nine months and have accepted the same terms now which were available to them in June.

Yarrow's to Close

Yarrow and Company have considerably startled the British shipbuilding world by posting the following notice at their Scotstoun yard:

Owing to repeated strikes, reduction of output, and demarcation disputes which have taken place in various industries throughout the country, the cost of shipbuilding has become excessive, in addition to which it is impossible to promise dates of delivery.

With the greatest regret we have therefore decided to temporarily close our works, with the exception of our experimental and research department, on or about November 30.

We shall reopen when conditions enable business to be carried on with some chance of success.

We give this early notice of our decision so that our employees may have every opportunity of obtaining work elsewhere.

Yarrow established a yard at Poplar-on-the-Thames in the London district and built there many splendid vessels, specializing in shallow draft construction for use on rivers and lakes in all parts of the world. After a few years the burdens of local taxation and heavy labor costs began to be irksome, and in 1906 they acquired the present site at Scotstoun on the Clyde and there have been building torpedo boat destroyers, river gunboats, and mercantile light craft. Your Pacific Coast readers will be interested in the present action of this firm, as they have a very active yard in British Columbia and about a year ago there was considerable rumor to the effect that they would concentrate the bulk of their work at that yard, gradually deserting the yard on the Clyde. Under normal conditions from 1000 to 1500 men are employed at Scotstoun.

World's Biggest Liner

Much interest is being evidenced in marine circles here in anticipation of the delivery of the White Star liner *Majestic*, ex-Bismarck, which will be ready for service between Southampton and New York early next spring. The *Majestic* will be the largest ship afloat, having a displacement of 56,000 tons, making her nearly 10,000 tons larger than the *Olympic* and about 2000 tons larger than the *Leviathan*.

The human interest figures on this greatest of passenger liners are rather striking. The hull, for example, if stood on end beside the Woolworth building, New York, would overtop that champion skyscraper by 164 feet. Her three smokestacks are each 30 feet in di-

ameter, which would allow ample room for two New York subway trains to pass abreast. The tops of these stacks are 184 feet above the keel, which is about equal to the height of an ordinary twelve-story building. There are nine decks, and the ship is liberally equipped with electric elevators. When carrying a full passenger list she will be inhabited by 5200 people, divided into 4100 passengers and 1100 crew. One thousand passengers are in the first class, 700 in the second, and 2400 in the third.

Grand Reception Hall

Perhaps the most interesting and unusual feature in the construction of this vessel lies in the arrangement of the uptakes from the boilers to the stacks. The uptakes to each stack are arranged to be brought up outboard, arching together over the ceiling of the saloon deck and uniting under the stack. The grand staircases are also arranged at the sides of the ship, giving a clear sweep of unimpeded space amidships for the great public rooms. Through these rooms there is an unbroken vista of apartments 250 feet long.

The appointments are very luxurious and include a large gymnasium, electric and Turkish baths, a mosaic and marble Pompeian swimming bath with a bottom area of 820 square feet, a depth of 9 feet, arranged with a gallery for spectators and with 30 dressing rooms.

Thirty Miles an Hour

The power plant consists of four turbines working on four propeller shafts and delivering a total of 62,000 H. P. Normally the propellers will turn 170 r. p. m., driv-



White Star liner *Majestic*, 54,000 tons gross, 62,000 H. P., 23 knots sea speed, 956 feet long over-all—the world's largest ship

ing the ship at 23 knots. The maximum speed is 194 revolutions, and this is expected to drive at 26 knots, or better than 30 statute miles an hour. She will be fitted with fuel oil burning boilers and is expected to consume about 11,400 tons of fuel oil in a round trip.

The watertight bulkheads in the hull are fitted with heavy hydraulically operated, electrically controlled watertight doors. The ship's decks have a total area of seven and one-half acres, and four times around her promenade deck gives the passenger a constitutional of one mile.

The Majestic is being finished by Blohm and Voss of Hamburg under special arrangement between the Allies and the German government and under the supervision of the representatives of the White Star Line.

Holland-America Liner

Speaking of big liners, while the Cunard Company and practically all the British passenger lines are confining themselves to what might be called intermediate class liners around 20,000 tons displacement, Harland and Wolff have recently laid down in their new Musgrave Channel yard at Belfast a 32,000-ton passenger liner for the Holland-America Line, which will bear the name of Statendam. This is the largest vessel laid down in the United Kingdom since the beginning of the war.

The first Statendam was launched at Queens Island yard of Harland and Wolff in July, 1914. She lay unfinished when the war broke out, was ultimately completed for the British government as a cargo carrier, renamed the *Justicia*, and turned over to the White Star Line for management. Near the close of the war she was torpedoed and sunk off the coast of Ireland.

The new vessel is the first of a large program which the Holland-America Line have projected. There

are two 18,000-ton vessels at the Glasgow yard of Harland and Wolff and a dozen smaller vessels are being built in Dutch yards and are to be engaged by Harland & Wolff.

Teutonic Broken Up

Speaking of Harland and Wolff ships reminds us that the famous old White Star liner *Teutonic* built by that firm in 1899 was sold the other day to a Dutch firm of shipbreakers and will soon be reduced to the junk pile. The *Teutonic* was one of the first transatlantic liners to break into the five-day class, when in the early '90s she made the trip from Queenstown to New York in 5 days 16½ hours.

Exchange Rates

One rather humorous phase of the shipbuilding situation, which is proving a boomerang to John Bull, is brought about by the curious condition in exchange. It will be remembered that when just after the armistice the American dollar became the standard and sterling exchange dropped very heavily, the American press saw an opportunity to tie knots in the lion's tail and were very jubilant over the situation, but the idea began to creep into their intelligence that the situation was entirely to the advantage of John Bull, as far as world trade was concerned, and it soon became very apparent that British financial circles were very glad to have the exchange stay at its low ebb; in fact, there was considerable evidence that London was, so to speak, "pegging" the exchange rate.

As soon, however, as Germany, Belgium, and northern France began to get their breath after the war and settle down to real work, the exchange as between sterling and continental currency began to show up much to the disadvantage of John Bull, and now it appears that our friend John is very suspicious that Berlin and Rotterdam are "pegging" the exchange rates.

Strange to say, he cannot see the humor in that situation.

Shipbuilding Costs

In shipbuilding circles it amounts now to John having brought his shipbuilding costs down to a point where he can possibly take orders for standard freighters at about £16 per deadweight ton. Under normal rates of exchange it might just be possible that freighters of the same standard type could be built in America at competitive prices, but at present dollar to sterling exchange rates John has the edge on his American cousin by approximately 20 per cent. On the other hand, due to continental exchange and other "extenuating circumstances" Hans can build this freighter for £11 and has the bulge on John by about 30 per cent. However, as our friend Goldberg remarks, "it doesn't mean anything," because nobody wants the freighter, and if he did want it he could go out and buy it from its present owner for about £6 per deadweight ton.

Special Types

When it comes to special types of passenger vessels, motorships, shallow draft steamers, floating cranes, and other varieties of craft in which a specialized knowledge of certain marine engineering phases enters as largely as economy in throwing a hull together, the work seems to go to the firms that know how to produce it so that we find Dutch steamship lines ordering from British yards, the Japanese navy ordering from an American yard, British corporations ordering from Dutch crane builders, and a general interchange, so to speak, of work among all nationalities in the same way that we Californians are used to receiving orders from South Africa for mining machinery or from Australia for special fruit handling equipment because we have learned by experience to produce the machine that will give results along those lines.



Scene at the opening of the new George V dock, London, England

THE BLOW-OFF COCK

The Cost of Ocean Freight from a Marine Engineer's Standpoint

By SEA FLAME

THE transportation of cargoes by sea is entirely dependent on the profits made. If the ship-owner loses money, he will lay up his fleet. If operating and overhead expense exceeds income, some one must lose. This is inevitable. All this being so, consider the cost of carrying freight in American-built ships. We are all anxious to see the "Grand Old Flag" floating over our ships on the seven seas, but when it comes to paying the bills, that's another story. We will not thrash over again the labor costs, but will take up, seriously, costs of operation.

First the initial price of the vessel must be considered; also her depreciation, which can hardly be less than 10 per cent per year; then her upkeep and repairs, her running expense, including fuel, food, paint and other supplies, and wages.

Construction Costs

Commencing at the beginning, take construction. It is safe to say that at least 25 per cent of initial cost could be saved by cutting out wasteful and useless things on American ships. Do not think the writer is unpatriotic, but the "contraptions" on American-built vessels are not seen on what we call "foreigners." Note the usual Shipping Board freighter, like the one the writer is at present chief engineer of. She has in the officers' quarters four highly finished porcelain water closets, flush tanks also porcelain, fitted with ball-floats and nickel fittings, entirely unsuitable for salt water; has twelve expensive porcelain hand wash bowls, with nickel fittings with fresh water supply. There are three six-foot porcelain bath tubs, with nickel fitted water heaters and showers; tiled floors in toilets and bath rooms. The crew are almost equally well provided for, as they have three hot and cold showers with nickel heaters, self-flushing water closets, with the petty officers' rooms supplied with porcelain wash bowls. The pantries have five nickel plated, highly finished coffee urns, porcelain sinks, etc.

Now all this costs tremendously when the labor of running drains, steam lines, etc., is added, together with the valves and fittings. And, unfortunately, these expensive arrangements are not appreciated by

Here is a department where in we invite all of our readers to get rid of their surplus steam or their scavenge gases.

We had thought of calling this department "The Safety Valve," but a San Francisco daily has already appropriated that name, and anyway a safety valve is a fitting used only in great emergencies. The engineer who is right on the job often has use for his blow-off cock, and his boiler seldom needs to use the safety valve.

Pacific Marine Review will not be responsible for any of the opinions given or conclusions reached in articles contributed in this department.

For instance, here is our old friend Sea Flame breaking out like a regular Bolshevik against what he calls the "bunk" of the "high standard of the American workman." We do not follow him here at all, and we would like to get some expressions along this line from our readers.

So, Mr. Mariner, when you get up a good head of steam here is an opportunity to unburden your mind.

those for whom they were supplied. True, a few appear to have some ideas regarding the use and care of the articles, but the majority do not.

Freighters De Luxe

In addition to pantry and lavatory fittings of a most ornate and expensive type, the electric installation expense is great—fans in every room, and in some two; call bells in most of the rooms; elaborate curtains and blinds; copper screens to doors and ports; fine carpets in rooms; best of bed and other linen. All of this runs into big money, and is for the most part carelessly handled by those for whom it is supplied. The old cry of the labor leaders of the "high standard of the American workman" is, in my opinion, insofar as it applies to seafaring men, all "bunk." The average man going to sea, be he American, Dutchman, Limey or Dago, is of about the same type. He has little

care for anything that is supplied him gratis. All the various fancy things on our American ships are in most cases wasted, and in a year or two destroyed and worthless. My old friend, Mr. R. P. Schwerin, was right when he said that the average white oiler was a pig. The old-timers in the Pacific Mail Company will remember the condition of the oilers' quarters and the alleys near them before the Chinese were engaged.

Engine Room Junk

The engine rooms, too, are crowded with expensive and intricate devices and so-called improvements, whose initial cost is enormous. While in theory they are presumed to effect great savings in fuel, etc., in practice the reverse is the case. One reason for this is that the average engineer does not know how to properly handle many of the lately installed additions.

Back to the Simple Life

The writer is aware that a long howl will arise when he says that if American steamship owners would make a revolution in building they might make money and thus carry our products in our own ships. All useless and "mollycoddling" things must be cut out. Build a strong and able hull. Fit her with a rugged and plain engine and good Scotch marine boilers, with no superheaters or other foolishness. Have one dynamo for night use only. Leave out cold-storage and wireless on freighters. Have the main feed, air pump, circulator, bilge and sanitary pumps work off main engines. Have one general service pump. Cut out all fresh water supply to all rooms. Have a hand pump in the galley and another on deck, and no more. For the general crew have plain, substantial toilets and wash rooms. Cut out steam heaters, electric fans, porcelain wash bowls, baths, etc. Build a plain, strong, fool-proof job, and then you can compete with the "foreigner."

Of course the objection will arise that no one will go to sea in such ships. Don't be afraid of that. You will get men, and probably better men, for they won't be "sissies" or tourists. In the old days there was no lack of men, and those days will come back.

A CRANKLESS RECIPROCATING ENGINE

MR. A. G. M. MICHELL, inventor of the Michell thrust block, has recently developed a high speed reciprocating engine on the swash plate principle, using the Michell thrust block to take the thrust of the piston against the swash plate. The swash plate principle is not new and has been applied in the past by numerous inventors, but has always failed in a practical way through lubrication difficulties.

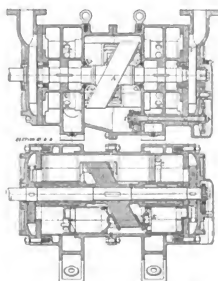
The Michell thrust bearings are good for a load of at least 500 pounds per square inch and have been in every-day use under loads many times greater. Mr. Michell carefully worked out the proportions of his trial engine so as to get a perfect balance between the weights of the reciprocating pistons and the swash plate and has succeeded in producing an engine which runs perfectly at a speed of 1200 r.p.m. and promises good operation at much higher speeds.

As will be seen from the illustration herewith, the cylinders of the engine are arranged concentrically about the shaft and are rigidly connected in pairs on opposite sides of the swash plate. The swash plate is keyed to the shaft which carries also on keys at the outer ends of the groups of cylinders a rotary valve controlling the admission of steam to the cylinders. The engine is designed to work on the uni-flow principle, the exhaust steam being discharged through the ports marked "C."

The test engine has eight cylinders, each five inches in diameter, arranged four on each side of the swash plate. With a gauge pressure of 150 pounds per square inch and a condenser vacuum of 26 inches, a horsepower was developed equal to 0.92 i. h. p. per cylinder per 100 r. p. m. The engine, as stated, was run successfully under load at 1200 r. p. m., and it is believed that it will be entirely safe to run it at 1500 r. p. m.

On this test engine the swash plate was made at an angle of $27\frac{1}{2}$ degrees. The tests have shown this angle to be larger than necessary, and Mr. Michell states that in future engines the angle will be $22\frac{1}{2}$ degrees or less.

It is very evident that this design, if successful in ordinary practice, will make a very compact and light unit. The test unit as described



Sectional elevation and plan of the Michell swash-plate reciprocating steam engine

would have an outside diameter of about 20 inches and an over-all length of 3 feet. At 1200 r. p. m. it would produce 88 horsepower and at 1500 r. p. m. 110 horsepower, working on a comparatively low

steam pressure. It will be evident to engineers that this design lends itself very readily to the internal combustion type of engine, and we may have here the solution for the generation of large powers in light compact units with all the economy of the direct application of heat energy from fuel oils.

The design as worked out permits of easy accessibility to all parts for repairs and adjustments, provision being made for adjusting the distance between the Michell blocks on opposite sides of the swash plate by means of a screwed sleeve with a notched head. Lubrication of the swash plate is provided through an ample supply of oil maintained by means of a gear driven pump.

Applied to marine propulsion, there would probably be two units geared to one propeller shaft, the gearing problem being easily taken care of in a single reduction by gears of moderate dimensions.

Burning Fuel Oil

SET the burners open wide,
Do not touch the valves at side;
Keep the pressure on the pump,

And up the bally steam will jump.
If the smoke is black and thick,
Open up the fans a bit;
If the smoke is thick and white,
To slow the fans will be quite right;
For when sufficient air is given,
No smoke ascendeth up to heaven.
If the jets refuse to squirt,
Assume the cause is due to dirt.
Should the flame be short and white,
You have combustion clear and bright;

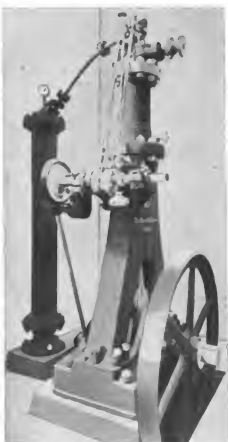
But should the flame be yellow and long,

Combustion is entirely wrong.
A wise man to his heater sees,
And keeps it 200 degrees;
To have it more is not quite wise,
Because the oil may carbonize;
A little lower has been found
To give as good results all round.
If the filters are kept clean,
No rise in pressure will be seen;
But should the pump kick up a ruction,

There's likely air within the suction.
The pressure governs the supply,
So do not keep it very high.

If these instructions you will follow,
You'll beat the other fellow hollow.

From the Proceedings of the I. M. E., London.



The first Diesel engine

NEW COAST GUARD CUTTERS

The Union Construction Company Delivers a Turbo-Electric Drive Vessel to the United States Treasury Department

JUST a year ago in Pacific Marine Review for October, 1920, we published a detailed description, illustrated with plans, of the new Coast Guard cutters building at the Union Construction Company, Oakland. The first of these four cutters, the U. S. S. Tampa, has just completed her official trials satisfactorily and has been accepted by the Treasury Department. Through the courtesy of the Union Construction Company we publish herewith a fine picture of the Tampa on her trial run.

Briefly, the Tampa is a splendidly built, well designed, seaworthy vessel, 240 feet long over-all, 220 feet long on the water line, of 39 feet molded breadth, and 25 feet 6 inches molded depth, having a displacement of 1600 tons when loaded to 14 feet mean draft, this displacement including 90,000 gallons of fuel oil, 24,000 gallons of fresh water, and 35 tons of stores. For a more detailed description of the general features refer to the article on page 114 of Pacific Marine Review for October, 1920.

Power Plant

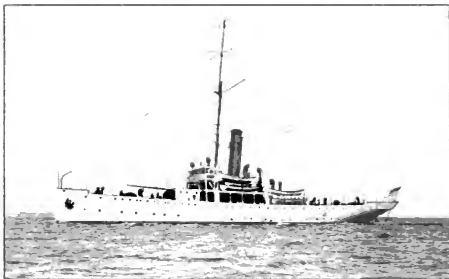
Two Babcock & Wilcox watertube boilers supply steam for the turbo generator. The working pressure is 200 pounds with 50 to 75 degrees superheat. The boilers are fitted with the closed stoke-hole system of forced draft and have a total heating surface of 5800 square feet and a total furnace volume of 600 cubic feet. They are equipped for oil burning with mechanical atomization.

Turbine

The turbine is of the Curtis-General Electric type directly connected to a General Electric a. c. 3-phase, 2-pole generator running about 3000 r. p. m. with an output of about 2100 K. W. This generator supplies current at 2300 volts, 60 cycle, to a synchronous 46-pole 2600 H. P. motor directly connected to the propeller shaft and turning over at full power 130 r. p. m. The propeller is 13 feet in diameter, 4-bladed, of cast steel.

On her trials over the measured mile the Tampa developed 16.3 knots per hour average speed.

Two separate exciters, one being a spare, furnish current for the excitation of the generator and motor fields and also power for driving various auxiliaries, such as the ventilating motor, steering gear motor, gypsy head motor, radio apparatus,



The United States Coast Guard cutter Tampa on her trials in San Francisco Bay

refrigerating plant, electric washing machine, and lights for the ship.

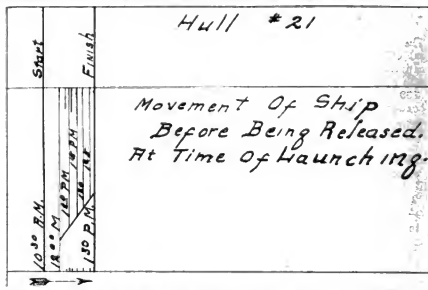
Control

The control equipment is so arranged that it can be operated electrically from a distance or in case of emergency by hand. On the trial the control functioned perfectly, all of the necessary maneuvers being effected with efficiency and dispatch. One very noticeable feature of the electric drive as installed on the Tampa was the entire lack of vibration and the uniformity of torque on the propeller. This feature of automatic control in electric motors

of this character absolutely prevents racing of the propeller in rough seas.

We shall hope in a future article to be able to present to our readers the complete trial data of one of these vessels so that comparison may be made between this drive and other types for economy of operation.

The Tampa will certainly make a very welcome addition to the fleet of the Treasury Department and should be of great service in coast patrol, and marine rescue work.



Exact reproduction of card markings secured at the launching of the Achatina, an 8400 dead-weight ton oil tanker for the Anglo-Baxon Petroleum Corporation. These markings show the movement of the sliding ways upon which the hull rests from the time that work is commenced, removing the shores from under the ship, until the time that the trigger is released allowing her to slide into the waters of the bay. This very slight movement shows the skill with which the launching cradle on the sliding ways is constructed and adjusted to gradually receive the weight of the hull as it settles on removal of the permanent shoring. The Achatina, was built by the Union Construction Company, Oakland, California.

UNCLE SAM'S LATEST DREADNOUGHT

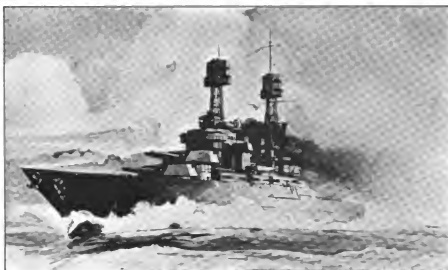
New York Shipbuilding Corporation Launches the Electrically-Propelled Battleship Washington

On September 1 the United States superdreadnought Washington was launched at the Camden plant of the New York Shipbuilding Corporation. The 16,800 tons of steel forming the uncompleted hull was officially named Washington by a ten-year-old lady, Miss Miss Jean Summers, of Walla Walla, Washington, assisted by a bottle of perfectly good California champagne.

The Washington is a sister ship of the Colorado, which was launched from an adjacent way at the same yard last March. Although authorized in 1916 and contracted for in January, 1917, construction of these two superdreadnoughts of the most powerful type afloat was not begun until the spring of 1919, as the Navy Department purposely deferred its capital ship program during the war so that all available shipbuilding capacity could be concentrated on the construction of troop and supply ships and torpedo boat destroyers to meet the immediate emergency.

The main dimensions of the vessel are as follows:

Length, on water line.....	600'-0"
Length overall	624'-6"
Breadth, extreme	97'-5 $\frac{3}{4}$ "
Depth, to main deck.....	47'-2"
Draft, normal	30'-6"
Displacement (weight), normal load, tons about	32,600
Displacement, full load, tons about	33,600



Artist's conception of the completed U. S. S. Washington

Like all recent United States capital ships, the Washington will be electrically propelled. Her main engines will consist of two 15,000 H. P. Westinghouse turbo-electric generators, which will generate electricity to operate four 7300 H. P. Westinghouse motors, one for each propeller. The steam will be generated by eight watertube boilers fired by oil.

This electric drive is superior in several particulars to other methods of propelling a warship. A most important advantage is due to the fact that the main turbines are not connected mechanically with the propellers

and no long shafts run through the ship. In consequence, the main turbines can be located in the most convenient position with reference to the ship's military requirements, such as protection from under-water attack, ammunition storage and handling, turret construction, and so on. An electrically driven battleship can therefore be made more efficient as a fighting machine than can one driven by any of the older methods, and the United States Navy is far in advance of other nations in the development of this type of propulsion.

Electric drive also provides great maneuvering power, because the propellers can be almost instantly reversed with full power. In addition, the turbines operate under the best possible conditions for high economy, which means that the ship possesses a greater radius of action than one with a less economical form of drive. In the recent trials of the U. S. S. Tennessee, which is also equipped with Westinghouse electric propulsion, and is similar in tonnage and horsepower to the Washington, it was found that this great vessel could be brought to rest from full speed within three minutes, turned on a circle like a destroyer, and driven backward at fifteen knots, all of which are believed to be records and prove the excellence of her propelling machinery.

The main battery of the vessel will consist of eight 16-inch, 45-caliber, breech-loading rifles, mounted in four turrets, two forward and two aft. Each of these monster rifles, of which there will be two in each turret, will be over 60 feet in length.



Two 7300 H. P. motors for the U. S. S. Washington on test stand at the works of the Westinghouse Electric and Manufacturing Company

Westinghouse photo



View in the control room of the U. S. S. Tennessee. The propelling equipment of the Tennessee is identical with that to be installed in the Washington

Westinghouse photo

The secondary battery will consist of fourteen 5-inch rapid-fire guns placed in advantageous positions. For protection against hostile gunfire from enemy ships all vital parts of the vessel will be adequately protected by heavy armor. This will be arranged in accordance with the best American practice.

All four turrets in which the main battery is mounted, as well as the barbettes, which contain the intricate mechanism for turning the turrets and their guns in any desired direction, are entirely encased in heavy steel armor.

Probably almost as important as the armor itself, from the standpoint of protection against gun fire and torpedo attack is the watertight subdivision of the huge fighting craft. The portion of the vessel above the splinter deck, which is practically at the load water line, is very well subdivided by watertight bulkheads, but below this deck the vessel is divided honeycomb-like into a multitude of comparatively small watertight compartments. This is accomplished by closely placed transverse bulkheads throughout the length of the ship and several watertight longitudinal bulkheads.

Each of the eight watertube boilers is in a separate watertight compartment, as is also each of the two turbo-generators which generate the electrical energy for the operation of the main propelling motors. The four main propelling motors are located in three watertight compartments. With this subdivision even

if torpedo damage should penetrate into the portion of the vessel occupied by the propelling machinery, the vessel would not be put out of commission, since the simultaneous flooding of one or more of the boiler compartments, one turbo-generator compartment, and one or more propelling motor compartments would neither sink the vessel nor render it un navigable.

To operate this well nigh impregnable floating fortress a complement of forty-six commissioned officers, twelve warrant officers and 1022 enlisted men, including seventy-one marines, will be carried. Accommodations for commissioned and warrant officers will be located aft on the second and third decks. The crew's quarters will be forward and amidships on the main deck and second decks.

In general appearance the Wash-

ington will resemble the other capital ships recently added to our navy. Forward her shell will have a very pronounced flare outward from the water line to the upper deck. This flare, carried undiminished forward, naturally results in the vessel's clipper stem, intended to facilitate the stowing and handling of her anchors, of which there will be three. This clipper stem is practically the exact opposite of the ram type of bow in almost universal use on battleships a generation ago. The pronounced flare also makes possible a roomy deck in spite of the very fine water line forward. The upper deck is the weather deck from the stem to abaft amidships. Here the main deck, next below the upper deck, becomes the weather deck and extends as such to the stern. The stern is of the cruiser type, now common to most large war vessels.

The launching of the battleship Washington comes just fifteen years after the delivery by the New York Shipbuilding Corporation of the armored cruiser Washington, since renamed the Seattle. At the time of her delivery in 1906 the old Washington was the last word in naval construction and her size and armament form an interesting comparison with present-day developments.

Length, on load water line	502'-0"
Length, overall	504'-5½"
Breadth	72'-10½"
Depth	42'-2¼"
Draft, normal	25'-0"
Displacement, normal load, tons	14,500

Between the delivery of the first Washington and the launching of the battleship by this name, New York Shipbuilding Corporation has built for the United States Navy seven battleships, forty torpedo boat destroyers and a destroyer tender, and now has under construction the battleships Colorado and Washington and the battle-cruiser Saratoga.



Photo of the recently completed U. S. S. dreadnought Maryland, a sister ship to the U. S. S. Washington

NIPPON YUSEN KAISHA

Japan Mail Steamship Company Celebrates Twenty-fifth Anniversary of Its Seattle-Oriental Service

IN 1885 the Kyodo Unyu Kaisha (the Union Transport Company) and the Mitsubishi Kaisha (the Three Diamond Company) amalgamated to form the Nippon Yusen Kaisha (Japan Mail Steamship Company). The capital of the combination at that time was 11,000,000 yen, and the combined fleet included 58 steamers aggregating 68,700 tons. The new company gradually extended its Japanese coastal operations to include Korea, North China and Vladivostok, and in 1893 inaugurated a regular ocean service to and from Bombay in the interests of the cotton industry in Japan.

In 1896 its capital was increased to 22,000,000 yen, and three more lines of passenger and freight services were established under a mail contract with the Japanese government. These three lines were the European, the American, and the Australian. We are principally interested on the Pacific Coast in the American line, which was established for fast freight, passenger and mail service between Puget Sound ports and Yokohama.

In 1914, after the outbreak of the war, the Nippon Yusen Kaisha established new freight and passenger lines; in 1915 again doubled its capital to 44,000,000 yen; and in 1916 opened a regular freight service between the Far East and New York via the Panama Canal and also initiated a freight service to New Zealand. In 1918 the capital was again increased to 100,000,000 yen.



One of the "Big Four" at a Seattle dock

In the maintenance of its European services during the war the company lost four mail steamers and one fine new freight carrier. At the present time the Nippon Yusen Kaisha has 102 steamers aggregating one-half million tons gross, and its plans in the not far distant future



The Nippon Yusen Kaisha steamship Kushima Maru on the quiet waters of Puget Sound

call for the construction of a further half million tons gross, including many fine passenger steamers.

On the American line running out of Seattle this company places its main reliance on what are known as the "Big Four," with sailings every three weeks. Running westward the ports of call are Seattle, Victoria, Yokohama, Kobe, Nagasaki, Shanghai, Manila and Hongkong. Eastward the ports of Keelung, Yokkai-chi, and Shimidzu are included in

addition to the others. The "Big Four" include the Fushimi Maru and Suwa Maru, 21,000-ton displacement steamers with a length of 525 feet, 63 feet beam, 37½ feet depth, and a sea speed of better than 17 knots; and the Kashima Maru and Katori Maru of 20,000 tons displacement, 510-foot length, 61-foot beam, 36½-foot depth, and 17½ knots speed.

The Kashima Maru, whose pictures illustrate this article, takes care of 126 first-class, 56 second-

class and 200 third-class passengers. All four of these vessels were transferred from the European line to the American line early in 1918. They are new vessels of the very latest type of construction, twin or triple screw, with ample weight and stability to insure comfortable, steady running even in exceptionally rough weather, and provide a splendid service for Oriental tourists or commercial travel.

INTERNATIONAL CONCLAVE OF PORT AUTHORITIES



AUTHORITIES on harbor development from the greatest ports of the world are speakers on the program of the great international conclave to be held in Seattle October

11-14, under the auspices of the American Association of Port Authorities.

Word has reached Seattle that the foreign relations committee of the Senate has favorably reported on a resolution authorizing President Harding to ask foreign nations to send official delegates to the convention. This will add tremendously to the significance of the conclave, which will consider port development and cargo handling topics.

The program as announced follows:

P. D. Donald, chief engineer, Clyde Navigation Trustees, Glasgow, "The Port of Glasgow."

J. Ross Hanahan, president Chamber of Commerce, Charleston, S. C., "Ports of Charleston, S. C."

R. E. Armstrong, secretary St. John Board of Trade, St. John, N. B., "The Port of St. John, Canada's First Winter Port."

H. McL. Harding, consulting engineer of the State of New York on barge canal terminals, "The Appraisal of Waterfront Terminals and Properties."

L. A. P. Werner, secretary and general manager of the Mersey Docks and Harbor Board, Liverpool, "Port Management."

Harry Pillans, mayor of Mobile, Ala., "The Enlargement of a River Port by Reclamation in the Bay as Its Outlet."

Alexander R. Smith, New York, "The Port of New York, the Greatest Port in the World."

Captain F. T. Chambers, Washington, D. C., "United States Government Co-operation in Port Development."

Frederick H. Fay of Fay, Spofford and Thorndyke, Boston, "The Port of Portland, Me."

Lieutenant Colonel H. C. Boyden, Portland Cement Association, "The Practical Side of Scientific Concrete."

M. H. Bronsdon, city engineer, Providence, R. I., "Cargo Unloading Apparatus."

J. B. Strauss, Strauss Bascul Bridge Company, Chicago, "Harbor Transit Sheds."

Frank G. White, chief engineer Harbor Commission, San Francisco, California, "Ship Worms and Other Marine Borers."

B. O. Allin, director of the Port of Houston, Texas, "Dock Aprons."

Cyrus Kehr, chairman Joint Board of Nation Planning, Washington, D. C., "Seaports and National Planning."

M. F. Steinberger, special engineer Baltimore and Ohio Railroad, Baltimore, "Co-operation with Railroads by Steamships and Export Interests."

William H. Adams, consulting engineer, Detroit, Michigan, "The Analysis of Values of Waterfront Property."

Colonel John Millis, Corps of Engineers, Fort Sheridan, Illinois, "The Regulation of the Great Lakes."

Justin Greiss, vice-president Mc-Meyer Interstate Company, Bedford,

Ohio, "Recent Developments in Bunkering Cranes, Cargo Coal Loading Equipment and Shipbuilding Cranes."

W. R. Sinks, manager grain elevator department of James Stewart & Co., Chicago, Illinois, "The Evolution of a Grain Elevator."

N. Rufus Choate, chairman San Diego Harbor Commission, "The Port of San Diego, California."

M. B. Rider, Lakewood Engineering Company, San Francisco, California, "Freight Handling Problems."

Commander Walter H. Allen, public works officer, U. S. Naval Training Station, Great Lakes, Illinois, "The New Naval Harbor on Lake Michigan."

P. R. Hicks, Chicago, Illinois, "The Economic Value of Crossed Wood in Wharf Construction."

D. J. Owen, general manager and secretary Belfast Harbor Commissioners, Belfast, "Docks and Harbors, General Structural Layout, Systems of Control, Operation and Charges."

John N. Cole, commissioner Department of Public Works, Boston, "The Port of Boston."

J. Spencer Smith, vice-chairman of the Port of New York Authority and president of the New Jersey Board of Commerce and Navigation, "Port of New York Authority."

Charles T. Leeds, Los Angeles, "Prevention of Silt Deposits in Southern California Harbors."

The convention will open formally at 10 a. m. on Tuesday, October 11, with addresses of welcome by Governor Louis F. Hart, Mayor Hugh Caldwell and Dr. Christensen. The sessions will continue through four days.



FULL SPEED AHEAD

EDITED BY ANDREW FARRELL

Deep-sea Shipping

35 Cents a Ton

What will happen on the Pacific Coast in the event that the Shipping Board decides to supplant the present M04, under which government vessels are operated by private companies, with a bareboat charter form is something that cannot be predicted. Uncertainty as to what the board's form may be prevents even a guess. But this may be said positively: unless the bareboat charter is liberal, most of the freighters in operation today will be tied up; what will occur in the case of the combination vessels managed by Matson, Pacific Mail and Pacific Steamship depends upon the terms offered by the board for these craft.

A Difficult Task

No action has been taken by the Pacific American Steamship Association regarding a bareboat form because the association has had no intimation as to the board's plans. Apparently Messrs. Frey, Smull and Love intend to draft a form and then say to the operators: "Here it is. Take it or leave it." For such a course there is justification, considerable difficulty having been experienced by the former board in arriving at an operating agreement in conjunction with the different companies concerned, and calling the private operators into conference on a bareboat form probably would result in similar delay. On the other hand, the Shipping Board faces a difficult task in preparing a plan that will end its enormous losses and at the same time make it possible for private operators to charter vessels; unless, indeed, the board really wishes to withdraw its tonnage and sees in a stringent charter form the best means to accomplish that end without making an open confession. If that motive were attributed to the board the outcome of course would be foregone.

Some private owners would welcome a bareboat form; the larger the charter money demanded the better they would be pleased. They would receive more cargo in the event that government tonnage were tied up generally, and rates also would rise immediately, both developments being of very great ad-

Full Speed Ahead: Deep-sea Shipping, 605; Marine Insurance, 611; In the Shipyards, 617; With the Exporters and Importers, 625; Personals, 630.

vantage to the old-time owner who knows his business and who has had an opportunity to write off a large portion of his valuation. The non-owning operator, the man, that is, who is managing government vessels exclusively, finds himself facing extinction, for even if rates were quite reasonable he might not feel warranted, having regard to trade depression, in chartering any bottoms whatever.

6 Shillings for Foreigners

Just how difficult is the board's task may be gathered from a statement prepared by a Pacific Coast shipping man. He compared the Shipping Board steamship West Ira, a standard 8800-tonner, with a foreign vessel, British or Japanese, chartered at the current rate of about 6 shillings a deadweight ton a month on the so-called "government" time form. He discovered that the Shipping Board would have to make a bareboat rate of 35 cents a deadweight ton a month in order to attract charterers; even with such a low rate in effect, he said, operators might prefer to take a foreign vessel at the current rate of 5 shillings for a long term. Lacking information as to what the proposed bareboat form of the board might be, he fell back upon the plan formulated by the American Steamship Owners' Association in the spring. Under both this form and the "government" time charter the charterer would pay for fuel, port charges, pilotage, agencies, commissions and consular fees; but under the bareboat plan of the association he would be subject to several charges from which he would be exempt under the government form; these are: manning the vessel, including liability insurance; provisioning; repairing; drydocking and painting, which in the aggregate would involve considerable expense. In the following comparison of costs, the charterer is shown as

bearing the expense of manning and provisioning the vessel but not of repairs and drydocking and painting, the first of which scarcely could be estimated:

S. S. WEST IRA, U. S. BARE-BOAT CHARTER

5879 gross; 8759 D.W.T.; 3643 net. Reciprocating engines; 3 Scotch boilers; 2800 I.H.P.

Crew of 40. Wages a month, \$4007; wages a day, \$133.57.

Subsistence a day, \$40, at \$1 a man; stores a day, \$50, estimated.

Total a day, \$223.57, or \$6707.10 for a 30-day month.

\$6707.10 divided by the deadweight tonnage, 8759, equals 76.6 cents a deadweight ton a month, cost of wages, subsistence and stores.

At exchange of £1 equals \$3.74, the "government" time charter at 6 shillings would cost \$1.12, or 35 cents more than crew and stores under a bareboat charter. In other words, the Shipping Board would have to fix a rate of 35 cents, if the charterer pays crew and furnishes stores, in order to equalize a 6-shilling rate. But this is not all; repairs, drydocking and painting have not been taken into account. Before 35 cents could appeal the board would have to shoulder these costs.

What prospect is there of the present allocation system being continued in conjunction with bareboat charters? Apparently little. Assigned tonnage could not compete with chartered. Some few routes of allocated vessels might be left untouched; the majority, it would appear, would be closed. If the board has any plan whereby these obstacles might be overcome, whereby allocations and charterings might go on together, American maritime circles will be interested in the details. That the board has some such plan, or intends to delay the application of a bareboat charter, is indicated by statements emanating from Washington. Retrenchments, it was said, would be made by withdrawing vessels from competing services, and the bareboat plan would be applied principally to new tonnage and to other vessels only after mature consideration.

The Pacific Mail Changes

During the last few years no development in Pacific Ocean shipping has aroused more of a stir than the resignation of John H. Rosseter as vice-president and general manager of the Pacific Mail Steamship Company and the appointment by George J. Baldwin, president, of Thomas A. Graham to succeed Mr. Rosseter as general manager. Announcement of the changes was made by Mr. Baldwin August 25 in the form of copies of letters that had passed between himself and Mr. Rosseter and of an announcement to the public. The pertinent paragraph was in Mr. Rosseter's letter to Mr. Baldwin:

"As a result of depression and adverse conditions facing American shipping, we have unhappily reached a point of irreconcilable differences of opinion. This concerns questions of administration and operation as well as the future of the company."

Nothing Radical Planned

To this statement neither of the two principals has added anything of a material nature, although, of course, the customary rumors were audible in San Francisco, one of which had it that the break came over the employment of Shipping Board tonnage in the trans-Pacific trade, the privately-owned vessels of the Pacific Mail having been withdrawn for the intercoastal service. Such rumors remain only rumors, and may be taken with as large a grain of salt as the hearer desires.

All indications are that nothing of a radical nature will be done by the new management. Mr. Graham said emphatically that the company was considering no new extensions and no changes. He reiterated this reply when he was asked categorically whether the company had plans for the construction of trans-Pacific liners. This might be interpreted as meaning, of course, that any changes under consideration were not imminent; on the other hand, it must be taken as setting at rest fears of any sudden upheaval, such as unfortunately characterize many shifts of management.

Their Undivided Attention

In one respect, however, things have changed. Mr. Rosseter, as is well known, was compelled to divide his time between W. R. Grace & Company and the Pacific Mail. Mr. Graham, on the other hand, and Cary W. Cook, assistant to the general manager, appointed with him, are quartered in offices on California street, adjoining the Pacific Mail building. The significance of this is that they are giving their personal and undivided attention to the com-



Thomas A. Graham

pany's affairs. Both are "approachable," a fact not without weight in creating for the reorganized company a favorable public opinion. Mr. Graham shows a marked ability to meet visitors and to dispose of them quickly, thus satisfying the public and at the same time conserving his own minutes.

To steamship operators Mr. Graham is not so well known as he is to railroad officials. As assistant freight manager of the Southern Pacific Company, with headquarters in San Francisco, he made a name for himself as one of the foremost traffic men of the United States. His name, if not a household word, was known in railroad offices in every state. The following biographical sketch is from the Southern Pacific Company:

Mr. Graham began his railroad career as office boy for the North Pacific Coast Railroad in July, 1878. He remained with that company until December, 1881, when he joined the Southern Pacific's San Francisco force. In his forty years' continuous service with the Southern Pacific Company he won his way to the forefront among the leading traffic executives in the transportation industry.

Days of Huntington

Mr. Graham's service dates back to the days of Huntington, Stanford, Hopkins and Crocker. From the present full train schedules and fast service, he looks back to the time when there was but one train a day between San Francisco and Los Angeles and between San Francisco and Ogden, to the time when it took nine days to haul immigrant trains (each passenger with his sleeping

outfit) from the Pacific Coast to the Missouri River; to the days of coal oil lamps, bell cords, hand brakes, and the picturesque old "Silver Palace sleepers."

Born in San Francisco September 11, 1864, Mr. Graham has grown up with the West. He was not quite fourteen years old when he took his first job with the North Pacific Coast Railroad.

On Puget Sound

Transferring to the Southern Pacific Company in December, 1881, he was clerk and later chief rate clerk in the San Francisco general passenger office until December, 1889, when he became district passenger and freight agent at Tacoma and Seattle. He was a pioneer for the company in the Puget Sound country, where he remained for ten years. On March 1, 1899, he was made district freight and passenger agent at San Jose, California, serving in that capacity until October 19, 1901, when he became assistant general freight agent at San Francisco.

In August, 1905, he went to Los Angeles, where he assumed the position of assistant general freight and passenger agent. This he held until March 1, 1911, when he was returned to San Francisco as general freight agent. On July 15, 1912, he was made assistant freight traffic manager, retaining this position until his present change to the Pacific Mail Company.

His associates attribute his success to a remarkable capacity for detail combined with a broad sound judgment on matters of policy. They say he has never been content to know everything about his own job, but that he has kept himself thoroughly informed on all phases of the transportation industry as well. He does not start anything until after careful consideration, they say, but once started he is persistent and aggressive. He has a reputation for his "long distance memory."

Cary W. Cook, who has been appointed assistant to the general manager, takes a long steamship experience to the Pacific Mail. He was Pacific Coast general manager of the American-Hawaiian in the days when that line had the greatest fleet under the American flag, when it was one of the very few large American operators. He is, therefore, of the old school. Mr. Cook was the choice of a large number of Pacific Coast operators for appointment to the new Shipping Board, preferably as chairman, but he was too much of a shipping man for appointment to a political board.

Daulton Mann, assistant general manager, remains with the company in that capacity.

China Mail Ready for Action

Walter S. Penfield of Washington, D. C., attorney for the China Mail Steamship Company, has spent several weeks in San Francisco and Honolulu perfecting the company's case for the expected tussle with the government over the employment of the company's American-flag vessels, China and Nanking, in the San Francisco-Honolulu trade. That a tussle is imminent is indicated by Mr. Penfield's statement that he had advised his clients to decline to pay a fine of \$5000, imposed by the collector of customs, Honolulu, for transporting twenty-five cabin passengers from San Francisco. By taking this course the China Mail will force the government to make the next move.

Constitutionality Questioned

Mr. Penfield said that the company questioned the constitutionality of Section 38, Merchant Marine Act, which prohibits any company engaging in coastwise trade unless 75 per cent of its stock is owned by American citizens. As to what arguments will be advanced to prove unconstitutionality, Mr. Penfield would make no statement. He did acquiesce in a suggestion, however, that there was doubt of the power of Congress to pass an act destroying what could be described as vested rights, which accrued to the steamship China when she was granted American registry in 1898 and to the Nanking because of her construction in an American yard, both of these events having occurred prior to the passage of the Jones bill. If such an argument should have weight with the Supreme Court, both the points brought forward by the attorney-general's ruling, that the China was foreign-built and was owned by a company not complying with Section 38, would fall together.

Regarding the foreign build of the China, which was dwelt upon at length in Pacific Marine Review last month, Mr. Penfield made the comment that all rulings issued by the attorney-general's office were not necessarily prepared by Mr. Daugherty himself; and he added that other government departments disagreed with this particular ruling.

History of Section 38

Mr. Penfield said that Section 38 grew out of the insistence of a single American company, which must compete with Canadians, that the Jones bill prohibit any vessel engaging in coastwise trade unless she were 100 per cent American-owned and in foreign trade under the American flag unless 75 per cent owned. Fortunately, he said, such a rigorous provision failed, but the bill did



Herbert N. Thomas

demand 75 and 50 per cent ownership. He took occasion to criticize the action of the Shipping Board in denying coastwise privileges to the China Mail when the board itself owned competing vessels; he spoke also of notice being served on the company only a few hours before the scheduled time of the Nanking's sailing, when many passengers had been booked and some were already aboard the vessel; and he dwelt at length on the fact that the China Mail was an American company, incorporated in California, a large portion of the stock of which was held by American Chinese, and that the company had restored the American flag to the trans-Pacific route.

In the meantime the China Mail is shut out of the coastwise trade. It has made its position stronger, however, by dispatching the British steamship Nile, heretofore employed in the Oriental service, to the East Coast of Asia, where she will be used as a feeder to the Nanking and China. These vessels will not call at Singapore after one more voyage, and the Nanking will serve them by plying between Singapore, Batavia, Hongkong and Shanghai. In this manner the China Mail's trans-Pacific line will be made entirely American flag.

The China Mail has not purchased the Canadian Pacific steamship Empress of Japan and has no intention of buying her, an official of the former company said.

Thomas Succeeds Garland

Alexander M. Garland, who has been in charge of operations of the

China Mail, has resigned and has been succeeded by Herbert N. Thomas, general passenger agent, who also retains the latter position. Mr. Thomas became a ticket-seller of the Southern Pacific in San Francisco in 1905, serving one year, after which he went with the Cook travel agency; and in 1907 became booking clerk and later chief clerk of the passenger department, Pacific Mail. When A. G. D. Kerrell, general passenger agent, died, Mr. Thomas succeeded him. The Pacific Mail sold its large vessels in 1915, and Mr. Thomas went to the China Mail, in the organization of which he had a part, and has remained general passenger agent since. In handling the passenger business of the China Mail Mr. Thomas has pursued a policy of "courtesy first," and as a result made a good showing indeed, despite the relatively small accommodations of his vessels.

Navy May Withdraw Transports

"Transport Service of the Government": This pamphlet contains a report of hearings before the House committee on the merchant marine and fisheries, May 25, June 9 and 16; it consists of 165 numbered pages and a few others not numbered; it weighs 6¼ ounces; except for the printing that clutters up its pages it would make good blank paper. Its contents are characterized by two curious facts: the United States Army, concerning the nautical ability of which there is grave doubt, wishes by all means to continue the operation of its slow, expensive and wasteful transport service; the United States Navy, concerning the nautical ability of which there is no doubt whatsoever, wishes to employ commercial lines. Those few words tell us the story briefly and make it unnecessary for anyone to read the 165 numbered pages.

Merchant Vessels Preferred

This attitude of the Navy Department is not of the lips only but is being given concrete embodiment. Washington is considering the abolition of the trans-Pacific transport service and the turning over of the business to private companies. It may be, of course, that the decision of the department will be against any discontinuance; but that there is a good prospect of favorable action is indicated quite clearly by the statement of Captain A. W. Marshall, office of naval operations, director of ship movements, before the House committee.

"We really prefer, if space can be obtained, to use merchant shipping and wherever we can we always do it—we take advantage of it in every

case," said he. "We do not consider that the Navy should operate vessels where they would compete with merchant vessels, and we cannot operate them as economically as we can obtain cargo space from well-established lines."

Apart from the general movement looking toward the abolition of the Army and Navy transport services, provided for in H. R. 5348, an agitation was begun in San Francisco by two exporting companies, both of which desired to have more space for Guam cargo than was offered by the Navy. These companies interested private steamship lines, which presented their case to the Twelfth Naval District; the district, in turn, compiled a "statement of facts" for the perusal of Washington. This statement, it is emphasized, was not a recommendation.

Two Companies Affected

Struthers & Dixon and the Pacific Mail are the two companies more immediately concerned, although any commercial line might have some interest. The vessels of the former line, all Shipping Board tonnage, now ply from San Francisco to the Orient, Manila included, and easily might be diverted to Guam and Manila on the westbound voyage, thus making China and Japan ports last. Guam might be made a port of call of the 502's of the Pacific Mail's Manila-East Indies service. These latter vessels could transport passengers as well as freight; those of Struthers & Dixon, not being passenger liners, could carry explosives.

What this Hawaii-Guam-Manila business would mean to a private company may be gathered from the following statement submitted by Captain Marshall, covering the year June 1, 1920, to June 1, 1921:

	Transport Newport News	Transport Panama Colon
Cost of operation	\$220,736	\$192,520
Passengers carried		
First	29	129
Enlisted	193	228
Cargo carried, tons	11,000	20,000

Would Keep One Vessel

"The cargo transported by these two vessels would have cost, if transported commercially, \$465,000," Captain Marshall wrote; "the passengers would have cost \$102,650. A total of \$567,650 would have to be added to the Navy appropriations in order to move all of this freight and passengers commercially. One vessel would have to be retained for operation by the Navy Department

in order to meet military requirements and about half the freight would be transported in this vessel. Therefore, the increase in the appropriation required would be about half of the amount set forth, or \$238,825. The saving to the government by placing the other vessel out of service would be \$206,128."

Some explanation of the above quotation is necessary. Cost of operation does not include any such charges as overhead, insurance, depreciation, interest on investment, port dues, repairs. In estimating the cost of commercial transportation, Captain Marshall put the trans-Pacific freight rate at \$15 a ton, and he was inclined to doubt that freights were much lower when he appeared before the committee. Nonetheless, the estimate appears high. He believed, moreover, that it would be necessary to retain one transport, in part because Guam is a closed port, and in part, apparently, because of the necessity of transporting explosives. The latter does not appear efficacious; the second undoubtedly would have to be faced, but Representative Edmonds said in this connection: "That would have to be changed. There is no reason why it should be a closed port. I have been there personally and I cannot see any reason for it whatever."

A Bit of Nonsense

To Senator Wesley L. Jones and the gentlemen of the National Merchant Marine Association:

One of you, that is to say, the senator from Washington, has forwarded to Chairman Lasker of the Shipping Board a statement prepared by an unnamed railroad man, in which the non-enforcement of Section 28 of the Merchant Marine Act is blamed in large part for the situation in which American shipping finds itself; the others, that is to say, the gentlemen of the National Merchant Marine Association, sponsor in this connection such statements as "had Section 28 of the Merchant Marine Act been put into operation, it may be confidently stated that few, if any, Shipping Board vessels would now be tied up for lack of cargo."

This Helps No One

This, gentlemen, is sheer absurdity. Such propaganda benefits no one, least of all the United States merchant marine. Reiteration of such statements, if unchallenged, will tend to confirm the nation in its habit of looking to Washington for remedies instead of setting to work in its own behalf. Many of

our laws are burdensome and should be changed, of course; but to attribute all our woes to non-enforcement of some certain retaliatory law is nonsense. Nonsense, gentlemen, nothing less.

The Merchant Marine Association apparently believes that the shipping depression is largely confined to the United States, for a statement of the organization says: "The marked shrinkage in the volume of ocean freight due to the trade depression of the past year has affected American shipping far more severely than foreign, the proportion of our foreign commerce carried by our own vessels having fallen from more than 50 per cent of the total in 1920 to barely more than 30 per cent this year." We may accept the figures as correct and still ask whether they prove the assertion of the first clause; we may go farther and inquire what Section 28, among other suggested remedies, might avail in the existing situation?

What Is Section 28?

Section 28, which aroused such a furor on the Pacific Coast in the summer of 1920, prohibits the granting of special import and export railroad rates to goods transported in foreign bottoms, but the Shipping Board is empowered to determine whether adequate American facilities exist. What sections of the country have enjoyed import and export rates? The Atlantic not at all, although a beginning is being made now; the Gulf slightly, both on freight originating in and near the Mississippi Valley and some coast goods destined to Europe that the Southern Pacific attempted to divert to the Sunset-Morgan route; the Pacific Coast very largely. In fact, import and export rail rates, speaking broadly, were purely of the Pacific, being designed to enable the transcontinental-Oriental route to compete with all-water transportation from the Eastern seaboard in the handling of products bound to or from the trans-Rocky section and particularly the manufacturing states of the East, which exchange finished products for raw materials of the Orient. In short, if Section 28 had any bearing whatever it was on the Pacific Coast's transcontinental business to and from the Orient.

Where the Trouble Lies

Quite a stir was aroused on the Pacific Coast when the meaning of Section 28 first was apparent, because there was general fear that foreign lines would be forced to the Atlantic. The fear was groundless; Section 28 has not been eu-

forced, despite an evident superfluity of tonnage on the Pacific; but another factor was of more importance: trade that formerly flowed from the East through the ports of the Pacific Coast began to seek the Atlantic-Panama-Pacific route in greater volume, until the Pacific Coast saw quite clearly that it could not hope to regain its old transcontinental business. At the present time the Atlantic is trading directly with the Orient, to such an extent that a recent shipment of 400 tons of Pittsburgh steel through Seattle or San Francisco is a subject of much comment.

What bearing has the non-enforcement of Section 28 had on this situation? None whatever.

Two Disconcerting Facts

Attention may be invited to two singular facts, singular and disconcerting. To replace the Oriental trade lost by the opening of the Panama Canal the Pacific Coast had but to turn to Europe, which demands the agricultural products of the West and in turn seeks to supply the West with manufactured goods. Despite the curtailment of European buying power, the trade is most promising. Well, who holds it? Two American lines have entered, the Isthmian and the European-Pacific service of Williams, Dimond & Company, the latter of which is being supplanted by the American-Hawaiian. They must compete with foreign lines whose name is legion and whose resources are almost limitless. Consider also the Atlantic-Panama-Far East trade. The combined cargo movement in both directions in the calendar year 1920 was 1,827,913 tons, more than twice the Pacific-European tonnage. Japanese and British vessels are in the great majority. Why have Americans been so blind to the march of events?

No, Senator Jones and gentlemen of the National Merchant Marine Association, there is something else wrong besides the non-enforcement of Section 28.

A.-H. and the Board

Beginning with the sailing of the steamship Alaskan from ports of the Pacific Coast in October, the American-Hawaiian Steamship Company will handle with its privately-owned vessels business heretofore conducted by Williams, Dimond & Company, American-Hawaiian agents, with Shipping Board tonnage under the name of the European-Pacific Line. When Williams, Dimond & Company made the first announcement of this new service a few weeks ago, con-

siderable interest was aroused, inasmuch as the action was altogether voluntary and the trade route involved is the best, except for the intercoastal, from the Pacific Coast to any part of the world.

All Vessels Returned

This action would have been taken sooner than it was if several steamships had not been under charter or engaged in government service. Making the change sooner would have involved the operation of a mixed fleet, some vessels being privately-owned and others Shipping Board; at length, however, the company recovered use of its entire fleet and now will employ it in a trade that has excellent prospects. In making this move the company was not actuated by any desire to avert relations with the government fleet, for its experience with the Shipping Board was altogether satisfactory, except for the inevitable tribulations connected with any dealings with any government agency. The change, besides, is a sequence to the policy of the Shipping Board, of developing trade routes that can be taken over by private companies. In view of an impending bareboat charter, too, the American-Hawaiian has wisely made itself independent of any disruption of services that may ensue.

May Be Used Coastwise

In another important respect the company finds itself in a stronger position. The vessels of the new European line may be employed in the intercoastal trade whenever desired, whereas allocated steamships could not be so used because of the Shipping Board's policy of limiting competition with privately-owned tonnage. Although shipments from Europe to the Pacific Coast are increasing materially, vessels have been compelled to sail with small cargoes, so that they have had space available for westbound intercoastal freight.

In its competition with foreign lines in the European trade, the American-Hawaiian has gained a good advantage in deciding to offer through bills of lading from interior cities of the Pacific Coast. Arrangements practically have been completed with the Western Pacific, Southern Pacific and Santa Fe for the issuance of such documents, although negotiations with the Northern railroads have not progressed so far. A through bill of lading is negotiable, whereas a local bill is not, so that shippers will be able to receive cash from their bankers much sooner than formerly.

Canada and Tolls Remission

Free passage for United States vessels using the Panama Canal is in a state of quiescence today and probably will remain so until a few minor questions, such as disarmament, the Shantung cession and Yap, have been settled. But sooner or later Senator Borah or Senator Jones or another will press the point to a finish.

The merits of the contention that our treaty with Great Britain does not prohibit favorable and discriminatory treatment of United States vessels had best be left to those who understand Egyptian hieroglyphics, Chinese politics and Einstein's theory, especially the last. No ordinary man is fit to discuss the meaning of diplomatic papers. But there is some cause for surprise in the attitude assumed by an influential body of opinion in Canada, the proponents of which say that even the exemption from tolls of vessels engaged in the United States coastwise trade would work to the detriment of our northern neighbor. They reason thus: being exempt from tolls, a United States vessel might load a part cargo at Boston and the remainder of her freight at Halifax or Montreal, and transport the whole to Seattle at lower rates than could be offered by a Canadian vessel in the Halifax-Seattle trade; or might have a similar advantage in moving goods between Philadelphia and Vancouver.

A Word from Canada

In this contention there is much merit. Perhaps discussion is useless now, in view of the vigorous effort being made to exempt all United States vessels regardless of their trades; yet if the latter effort should fail, and exemption of coastwise craft only be brought up, Canada doubtless would have a word for our ears. Then it might be well to be fortified with a counter-attack. Such a campaign might be prepared by proposing to exempt United States coastwise vessels from tolls only on the basis of cargo moving between United States ports; that is, to exempt the cargo ton and not the vessel ton. Such a plan would work out as follows: a vessel has, let us say, 8000 tons of cargo, of which 6000 tons is for Seattle and 2000 for Vancouver. Her tolls (on her Panama Canal measurement) are \$4000, or at an average rate of 50 cents a cargo ton. Let her be exempt for \$3000, the tolls due for 6000 tons of United States cargo, but liable for \$1000 for Canadian cargo. In transporting freight to Canadian ports she would have, therefore, no advan-

tage over a Canadian vessel; except that, of course, the American might decline to pass on the amount of the exemption to the American shipper and, using the saving as an indirect subsidy, cut rates on the Canadian cargo. Our neighbors might retort, too, that the scheme after all would give Boston an advantage over Montreal in trading with San Francisco. Such considerations, however, approach the precession of the equinoxes a trifle closely in their drawn characteristics. On the whole the plan appears feasible and may be worth discussion.

Regarding the Philippines

During the calendar year 1920, United States vessels carried 5,509,247 tons of cargo through the canal and paid tolls aggregating \$4,724,494.66, the total cargo of all vessels being 11,236,119 tons and tolls being \$10,295,362.21. If all American vessels were exempt, therefore, earnings of the canal, based on 1920 experience, would be reduced 40 per cent. In United States coastwise trade, including Atlantic to Hawaii, the tonnage movement was 1,185,727, or more than one-fifth. Exemption of vessels engaged in the coastwise trade probably would have cost the canal about \$1,000,000, no precise figures of the tolls paid by those vessels being available.

There is one more aspect of the coastwise exemption plan that should be considered. After February 1, 1922, the President may by proclamation extend the application of the coastwise laws to the Philippine Islands. If any act should be passed granting free passage to vessels engaged in the coastwise trade, there should be a specific statement made as to whether vessels plying between the islands and the United States are included. Inasmuch as Manila may become a serious rival of Hongkong, Great Britain probably would object to the inclusion of United States Philippine vessels, even though other criticisms were met. During 1920 55,144 tons of cargo moved from the Atlantic Coast of the United States to the Philippines and 72,350 tons in the opposite direction.

The Canal's Fiscal Year

Herewith is shown in tabular form the commercial traffic through the Panama Canal for the fiscal year 1921, by nationality of vessels. An analysis of this traffic shows American and British vessels far in the lead of those of any other nation, says the Panama Canal Record. In cargo tons, American vessels carried approximately 45 per cent of the total traffic passing through the canal, and British vessels 32 per

cent, with Japanese vessels third with approximately 7 per cent, and Norwegian vessels fourth with a little less than 6 per cent. The vessels of these four countries carried 89 per cent of the commercial cargo through the canal.

For 1921, the tons of cargo passing through the canal was greater

Briefs

The Submarine Boat Corporation is reported to be considering the inauguration of an intercoastal freight service with 5300-ton steamships, of which it owns 32. Announcement of entering the service was made several months ago, but the company

	No. of ships.	TONNAGE.				Tolls.	Tons of cargo.
		United States equivalent.	Panama Canal net.	Registered gross.	Registered net.		
Belgian	2	6,309	8,092	10,144	6,188	\$7,856.25	12,709
Brazilian	1	3,511	4,566	8,472	2,323	4,368.75	8,000
British	970	3,250,830	3,965,613	5,035,696	3,150,061	3,976,995.33	3,721,922
Chinese	63	104,727	109,727	301,231	116,415	147,052.75	61,737
Chinese	4	10,564	12,098	16,645	10,624	13,187.10	14,409
Costa Rican	16	2,696	2,784	2,983	1,971	2,957.76	2,112
Cuban	1	376	702	1,050	577	722.50	1,200
Danish	60	107,504	236,512	287,379	188,667	241,411.86	322,059
German	50	185,561	246,801	279,261	182,151	229,248.94	216,486
Italian	2	4,293	4,293	4,526	4,361	5,137.50	7,430
French	44	143,113	155,889	204,727	134,635	164,575.94	132,836
German	19	51,541	67,324	81,023	50,421	62,998.85	73,537
Italian	25	82,810	102,763	147,507	87,469	107,298.50	47,983
Japanese	136	538,205	612,245	668,961	527,693	655,176.51	758,617
Jugo-Slav	2	3,902	4,508	6,270	4,998	4,877.50	8,325
Mexican	4	4,135	5,032	5,854	3,553	4,354.56	3,745
Norwegian	140	462,990	548,227	719,138	455,777	523,311.84	637,087
Panama	8	1,382	1,370	1,568	1,340	1,630.50	1,600
Peruvian	60	86,786	157,495	239,045	127,292	107,160.54	105,222
Russian	4	9,725	11,279	15,844	8,641	12,156.35	11,343
Spanish	44	101,141	117,400	155,150	100,995	118,544.41	143,076
Swedish	25	74,665	113,661	119,810	90,134	92,331.25	128,910
United States	1,212	4,037,278	4,874,472	6,172,171	3,994,464	4,797,463.00	5,179,350
Totals	2,892	9,343,866	11,415,876	14,522,415	9,239,241	11,276,889.91	11,999,214

Panama Canal business fiscal year 1921

by 23½ per cent than for any previous fiscal year. The tonnage and tolls have kept pace with the cargo; the tolls for the past fiscal year exceeding by \$2,762,956.46, or 32½ per cent, the greatest amount collected during any preceding fiscal year.

In addition to the commercial traffic, as shown above, 426 government vessels transited the canal during the fiscal year, with tonnage as follows: Panama Canal net tonnage, 476,503; displacement tonnage, 898,663. (Displacement tonnage represents battleships, carriers, etc., where Panama Canal tonnage is not obtainable.) These vessels transited the canal free of tolls, carrying 453,769 tons of merchandise.

The canal completed seven years of operation at the close of business on August 14, 1921, having been opened to commerce on August 15, 1914. During the seven years of operation the total number of commercial vessels which made the transit through the canal was 13,416. The aggregate net tonnage of these vessels, according to the rules of measurement of the canal, was 45,869,942. The cargo they carried totaled 51,578,920 tons of 2240 pounds.

The foregoing traffic was made up of 6388 vessels of 21,933,325 net tons, carrying 22,215,402 tons of cargo, from the Atlantic to the Pacific, and 7028 vessels of 23,936,617 net tons, carrying 29,363,518 tons of cargo, from Pacific to the Atlantic.

did not place any vessels in the trade.

* * *

The Navy Department has awarded contracts for the transportation of coal from Hampton Roads in American vessels as follows: 5000 tons to Portsmouth, \$1.20; 5000 tons to Boston, \$1.10, both to Crowell & Thurlow; 3500 tons to Boston, \$1.10, Pendleton Brothers, Inc.; 7500 tons to San Diego, \$4.48, Munson Steamship Line.

* * *

The Shipping Board 535 Silver State arrived at Victoria September 1, having made the voyage from Yokohama in 9 days, 18 hours and 23 minutes at an average speed of 18.02 knots. This is held to be a record for American vessels in trans-Pacific trades. She is operated by the Pacific Steamship Company.

* * *

The Texas Transport & Terminal Company, with the Trans-Oceanic Company as sub-agent at San Francisco, Portland, Seattle, Vancouver, and Los Angeles, has been appointed general agent of the Compagnie Generale Transatlantique's Pacific-Europe service.

* * *

The Cunarder Aquitania arrived at New York from Cherbourg September 9 after a voyage of 5 days, 16 hours and 57 minutes, which is a post-war record.

Marine Insurance

CHARLES F. HOWELL,
Eastern Contributing Editor

Rate War Opposed

Despite constant pressure from influential quarters it is improbable that the American Marine Insurance Syndicates will yield to a demand for lower rates and, throwing all reserve to the winds, launch upon a rate-cutting campaign with foreign marine underwriters. In the judgment of the best informed, this would be suicidal. As is well known, the British hull market has had to make startling reductions in values and rates under spur of the violent competition among marine insurers resultant from the collapse of the Hull Agreement, to which extended allusion has been made in this department in recent issues. This movement has brought marine rates in the London market to a losing basis. Naturally enough, our own shippers and shipowners have, in consequence, found themselves with a competitive disadvantage in overhead and they have been urging the Shipping Board authorities to use their influence with the syndicates to bring down American rates; indeed, they are anxious to see a wide-open rate war with the London market. But, fortunately for our marine insurance interests, the majority of the managers of the syndicates are determinedly set against any further reduction, feeling that they have gone as far as they could when they lowered the rates in June from 15 to 20 per cent on Syndicate B vessels. Further action along this line would seriously imperil even a slight prospect of profit to the companies. Up to the line of safety they are willing to go, but they should not be expected to cross it.

New Syndicate Appointment

Thomas Spencer has been appointed resident surveyor at Philadelphia for the American Marine Insurance Syndicates, in the place of J. H. Messerol, who has resigned to engage in other work. Mr. Spencer's supervision will cover the Delaware River district. He has had a long experience as a seagoing chief engineer, and was formerly surveyor of the port of New York for the American Bureau of Shipping.

Certificate Not a Policy

Nothing has disturbed marine insurers for a long time so much as the recent decision of Justice McCordle, of the King's Bench Division of the English High Court of Justice, to the effect that a purchaser of marine insurance under a c. i. f.

contract is entitled to an original policy instead of a certificate issued by an insurance company against an open policy, and that the latter may not be substituted for the policy. It will be borne in mind that in England they do not employ a certificate because of the necessity of having a marine policy stamped within ten days of the arrival of a cargo. They have a method closely approximating it, however, in their employment of "permanent covers." British laws impose a penalty of from £100 up for violation of the stamp requirement, but it is the common thing for shippers over there to take a chance and ignore the requirement on this point.

American insurance companies have been employing certificates for the past half century, and foreign companies domiciled here do likewise. So useful and convenient are they that their issue has extended widely beyond the United States, and there can be no question that their discontinuance would be deplored by shippers everywhere. No reputable American underwriter has ever sought to repudiate them, no matter whether they carried the British tax stamp or not. In the opinion of marine underwriters this matter will blow over, and the use of the time and trouble saving certificate continue as before. Banks and brokers are, it is true, considerably excited over the McCordle decision for the moment; but so they were, a year ago, when the subject of brokers' certificates was under fire; that sensation soon subsided, although there was more reason for it than there is for this, and brokers' certificates are in use right along today.

The matter has been under consideration by a special committee of the American Institute of Marine Underwriters, consisting of T. H. Allen of Chubb & Son, F. H. Osborn of F. H. & C. R. Osborn, and Hawley T. Chester of Platt, Fuller & Company. This committee has reported certain recommendations back to the institute, but the question has been referred back to the committee and final action postponed. A wide difference of opinion prevails among American marine underwriters as to what action would be wise and equitable, and there is a general conviction that the importance of the court's decision has been greatly exaggerated and that no revolutionary changes in the American practice

will have to be made once the temporary excitement has subsided. At first a number thought the case should be carried to a higher British court, but this idea has rapidly lost ground because that is a slow process and the likelihood is that a natural inclination to sustain the lower court would prevail anyway.

Justice McCordle's sum-up was as follows:

I do not think that the act of 1906 covers the document now before me. In my humble view a document of insurance is not a good tender in England under an ordinary c. i. f. contract unless it be an actual policy and unless it falls within the provisions of the Marine Insurance Act, 1906, as to assignment and otherwise. I must therefore hold that the buyers were entitled to reject the documents upon the ground that no proper bill of lading and no proper policy of insurance were tendered by the sellers in conformity with the c. i. f. contract. I abstain from amplifying this judgment by the citation of other authority or the mention of further reasons in support of the conclusions I have deemed it my duty to state. It may well be that this decision is disturbing to business men. It is my duty, however, to state my view of the law without regard to mere questions of convenience. I desire to add four remarks:

1. That there is no finding or evidence before me of any course of dealing between the parties;

2. That there is no finding or evidence before me of any custom or general usage which modifies the long and clearly established legal rights of a buyer under a c. i. f. contract. If any such custom or usage be asserted then the point can be dealt with in some further action in the commercial court. Whether such an assertion can be proved may well be a question of doubt in view of the matters appearing in the *Manlie* case, 1919, 1, King's Bench, at page 206. See, too, the *Wilson Holgate* case, 1920, 2, King's Bench, at page 8, where Mr. Justice Bailhache said: "I am not satisfied that since *Ireland vs. Livingstone* was decided any custom has arisen which obviates the necessity for a tender by the seller of a policy of insurance if the buyer requires it."

3. It may well be that legislation is needed to enlarge the operation of the Bills of Lading Act, 1885, and the Marine Insurance Act, 1906.

4. That the difficulties indicated in this judgment can be easily, promptly and effectively met by the insertion of appropriate clauses in c. i. f. contracts.

For the reasons given I find in favor of the buyers with the results stated in the award. The sellers must pay the costs of the proceedings before me.

FIREMAN'S FUND

Insures Hulls, Cargoes,

HEAD OFFICE: CALIFORNIA AND SANSOME

JOSEPH HADLEY, European Agent
1 LOTHBURY, E. C.
LONDON

E. A. VALENTINE, Special Agent
714-715 BOARD OF TRADE BUILDING
PORTLAND, ORE.

FRANK G. TAYLOR, GENERAL AGENT FOR WASHINGTON, OREGON, ALASKA

Slow Premium Payments

Among all classes of marine underwriters there is loud complaint because of the extreme difficulty of collecting premiums from shipowners for business already on the books. This condition has reached a point where underwriters are canceling risks rather than submit to the indifference of certain clients who are willing to take their chances and "pass the buck" to their insurers. They are quick enough to send in a check for premiums when they scent a loss, but otherwise they take their time, realizing that they can always haggle over the premium comfortably once the vessel has passed safely through its hazards. Underwriters know from bitter experience the trouble involved in getting their pay for a risk that has already been survived. Most of the leading offices are spending much time and anxiety in liquidating overdue premium accounts, and it is eminently unjust that they should have to do so. Their condition is all the worse because of the slowness in securing their reinsurance, and also because of the pernicious habit of certain brokers in retaining in their possession for an unnecessarily long time the premium money they have received from their clients. It seems that this difficulty in premium collections is general; British underwriters are also complaining about it; but the latter have a great advantage over their American confreres in that the British broker is responsible for premiums, whereas in our country the insurer has to collect from the insured. It is suggested, here and there, that it might be well to take a leaf from the British book in this particular and fix the responsibility upon the broker. A little sobering responsibility would do no harm.

Towing Increases the Risk

The arrival at New York within a few days of each other of two ves-

sels carrying cargo and with disabled steamers in tow has emphasized the seriousness of this practice from the underwriting point of view. Picking up disabled vessels and towing them long distances substantially increases the cargo underwriters' risk on the towing steamer and should properly be made the subject of an additional charge. The tower earns large fees for this service and he should be billed by cargo interests for the additional premium chargeable by the underwriters. Hull underwriters are not entitled to additional charges on this account on annual policies, because the towing privilege is granted in the contract; but if the towing vessel is covered for the voyage only, underwriters ought to be entitled to an additional premium.

Packing Supervision Helpful

As has frequently been pointed out in these columns, marine underwriters are exercising a careful supervision over the packing of merchandise, and the results are proving of great advantage to our shippers. Before the late war foreign buyers of American products were continually complaining of the wretched condition in which goods reached them, largely due to the inferior containers used on this side. Several important foreign interests had announced their intention of no longer buying in this market on this account. Then came the epidemic of theft and pilferage, with the result that shippers found increasing difficulty in securing insurance against these hazards and were obliged to become amenable to the requirements of the underwriters in the matter of better methods of packing. Excellent improvements have followed from this spur, and if important experiments continue as happily as in the recent past there is a prospect of our shippers soon finding themselves possessed of containers superior to any employed anywhere.

South American Claims

Claims continue to pour in from South America, and the disquieting feature is that they frequently arise rather from market conditions than from actual insured perils. It is felt that underwriters' representatives in foreign countries should and could do much to prevent this state of things, but unhappily they seem generally disposed to aid the consignee in his attempts on the pocketbook of the underwriter. Some action toward meeting this condition may be undertaken in the near future.

C. F. H.

British Average Adjusting

Consul Leslie E. Reed of London reports as follows:

The Association of Average Adjusters held its annual meeting in London on May 20, 1921, when the chairman, Howard B. Hurd, gave an address on certain marine-insurance questions which, because of its authoritative character, should be of interest to underwriters and all persons concerned with marine insurance. On the subject of the rate of exchange to be adopted for the adjustment of claims on marine-insurance policies he said:

A leading principle is that a policy of marine insurance is a contract of indemnity, and the primary consideration is the extent of the assured's actual loss, subject to the qualification that it is not a perfect form of indemnity in consequence of, among other things, the insured value not necessarily being the actual value and the different methods adopted for the adjustment of claims relating to ships and goods, respectively. In the case of ships the measure of indemnity is the reasonable outlay for repairs without applying the depreciation by reason of the damage to the insured value, while in the case of goods the application of the rate of depreciation to the insured value may give less or more than an indemnity.

INSURANCE COMPANY

Freights and Disbursements

STREETS, SAN FRANCISCO, CALIFORNIA

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LOS ANGELES
230 BYRNE BUILDING

F. H. & C. R. OSBORN, Managers
ATLANTIC MARINE DEPARTMENT
72 BEAVER STREET NEW YORK

AND BRITISH COLUMBIA, 309 COLMAN BUILDING, SEATTLE, WASHINGTON

Another principle to be borne in mind is that the assignment of a policy of marine insurance from the seller to the buyer does not affect the insurers' liability (see marine insurance act, sec. 175 [2]). This has an important bearing on claims on goods where there has been a fluctuation of exchange between the time of the purchase of the goods and the time when the right of recovery accrues in respect of a claim under the policy.

The Rate of Exchange

Claims under foreign general-average adjustments present the most difficulty, and I think that the principle that the foreign adjustment is binding on both sides is subject to the governing principle that a policy is a contract of indemnity, and that there is nothing in the foreign general-average clause to prevent the conversion of the contribution shown in the foreign statement in foreign currency into sterling at such a rate of exchange as will give the assured an indemnity, and nothing more than an indemnity, in respect of his loss as shown in that foreign statement.

The whole question of the rate of exchange to be adopted for the adjustment of marine-insurance claims is one of considerable complexity and difficulty. It seems impossible to arrive at exact logical conclusions which meet every case. Subject to any express terms in the policy as to the rate of exchange to be adopted, the main principle to apply seems to be that a policy of marine insurance is intended to be a contract of indemnity whereby the assured is to be reimbursed with respect of his actual loss.

As regards foreign disbursements generally which form the subject of marine-insurance claims, it may be taken that where an assured has incurred expenses in foreign currency, which he has liquidated by the remittance abroad of a sum of money in his own currency, he is entitled to be reimbursed by the insurer for his actual outlay; in other words, the rate of exchange to be adopted is that at which the money was remitted abroad, provided there was

no undue delay which would operate to the disadvantage of the insurer.

Where the expenses incurred in foreign currency have been paid out of freight or other funds to the credit of the assured in the country where the expenses were incurred, the correct rate of exchange to adopt would appear to be that ruling at the time the freight or other funds could have been remitted to the assured had they not been utilized for the payment of the expenses.

General Average Adjustments

Further on in his address the chairman considered the laws of war at sea, one of the questions now occupying the attention of the Maritime Law Committee, and finally took up the question of general average adjustment, on which he spoke as follows:

Various suggestions have been made from time to time for the abolition of general average, but they have not materialized, and there are very strong arguments in the common interest of sea-borne trade why it should not be abolished. The utility of the custom justifies its universality and permanence. It is not by revolutionary but by evolutionary methods that we can obtain a solution of this question, and in the progress already made there is to be noted the improved methods adopted by adjusters to meet the changing conditions of modern commerce.

The increase in the size of ships and in the number of cargo interests in one bottom has vastly increased the work involved in a single adjustment, but to meet this development a system has been generally adopted for summarizing facts and tabulating statistics. A large part of the work involved in a modern general average adjustment is outside the actual work of the apportionment of disbursements, and is done to meet the wishes of underwriters in recording the settlements made by them respecting claims for loss and damage to cargo and general average deposits.

In 1896, arising out of a resolution brought forward by two of our representative members on behalf of underwriters, we adopted a rule of practice requiring average adjusters to ascertain the names of underwriters who had settled claims for loss and damage to cargo and general average deposits and to insert their names in the adjustment in order to safeguard their interests in the distribution under the final adjustment. It cannot be denied that this has been an important and most essential improvement.

Discussion of Deposit System

The general average deposit system is not without its objections. In the majority of cases the rate of deposit has to be fixed on very meager information as to the probable extent of the ultimate loss, and provision has necessarily to be made for a margin to meet contingencies. In 1908 this association invited a conference consisting of shipowners, merchants and underwriters to consider the question of a standard form of guaranty for use in such cases where the method of dealing with general average was resorted to by the parties concerned.

The discussion at the conference showed that there was considerable diversity of opinion as regards the expediency of the general adoption of underwriters' guaranties in lieu of deposits, and the views of underwriters were not favorable to the course, with the result that it was not found possible to draw up a standard form of guaranty which met the views of those immediately concerned. The shipowner, being responsible to all the interests to see that adequate security was taken, obviously could not accept anything short of a full guaranty, whereas underwriters were not prepared to guarantee more than to the extent of the insured value of the goods and objected to the time that would necessarily elapse before they could know the extent of their liability under the guaranty. While the position of average adjusters on such a matter is a neutral one, they

were pleased to co-operate with the object of endeavoring to promote any scheme which might facilitate adjustment and meet the wishes of those immediately concerned; and while the efforts were not successful, the discussion which took place served a most useful purpose in having both sides of the question ventilated.

A Suggested Solution

The only possible solution would apparently be a compromise between the two views by taking an unlimited guaranty with a time limit of, say, three or six months, during which period it would be possible to ascertain the probable extent of the loss and to arrive at a provisional collection which would more nearly approximate the ultimate contribution than is possible when the rate of deposit has to be fixed before the delivery of the cargo to the consignees. This would obviate the objection frequently raised that the deposit sometimes largely exceeds the contribution. It would also have this further advantage, that after the investigation which such an interval would allow it might be possible in some cases to dispose of the cargo's contribution by this provisional collection being accepted as a final discharge of the cargo's indebtedness. By keeping in view the fact that general average adjustment is more a practical than an academic question and by the co-operation of all concerned, it should be possible to devise means to adapt the methods of adjustment to meet the changing conditions of sea-borne trade.

The international aspect of general average is of importance not only from a legal standpoint but also with regard to international relationships. Having regard to the success of the York-Antwerp rules, it may be possible in time to reach a wider basis of agreement and achieve the double object of obtaining a greater uniformity of practice and extending community of interest, thereby promoting the cause of friendship between nation and nation, which is the surest foundation of peace.

In connection with the changed aspects of marine insurance law it is interesting to note that a new edition of the standard legal authority thereon, "Arnould on the Law of Marine Insurance," has just been issued. It has been revised in accordance with the practices developed in consequence of the war.

The Canadian Importer

Reasonable doubt may exist as to the good judgment displayed by Captain Carl P. Bissett, master of the Canadian Government Merchant Marine's Canadian Importer, but there

can be no question regarding the captain's dogged courage. He refused to quit his ship when she apparently was sinking; not only that, he declined a tow; he and his crew watched the other steamship disappear over the horizon and with that they too vanished from the sight of men for six days. The prospect of the Canadian Importer being brought into port appeared very poor indeed, but the Canadian government refused to abandon hope, and she was discovered after persistent search. Underwriters properly should be grateful to Captain Bissett for having averted a heavy salvage claim; they applaud his determination as of a sort rare enough nowadays; but what they would have said if ship and crew had disappeared may be left to the imagination. The question as to the judgment displayed by the captain, his remarkable courage being heartily conceded, may be summed up in this manner: was his chance of remaining afloat until rescued sufficiently good to justify his refusal of a tow; in other words, if his action were repeated many times, would underwriters win or lose? All this is beside the greater question of life. But Captain Bissett succeeded, which is sufficient answer to any criticism; and his conduct would have been good to think upon even if he had failed.

Log of the Voyage

The Canadian Importer, commanded by Captain C. R. Bissett, departed from Vancouver August 12 with 3,500,000 feet of lumber and general cargo for Auckland. On August 19 she had some trouble, as a result of which her hold and engine-room were flooded and her wireless was disabled, so that she could send no messages. When the Canadian Importer was 625 miles southwest of the Columbia River lightship, on August 25, distress signals were picked up by the steamship Cordova, which went to her assistance. The Canadian Importer declined to accept a tow, however, preferring to wait for a tug from Vancouver. The Cordova therefore proceeded upon her voyage, after calling for a tug, and the Canadian Importer disappeared, despite repeated search. In addition to passing vessels that kept a lookout, the Canadian Observer searched carefully and finally was rewarded August 31 by finding the derelict about 600 miles off Eureka. The two vessels and the salvage steamer Algerine and the tugs Sea Lion and Sea Monarch arrived at Victoria on September 13. When the Canadian Observer (the name is fitting enough)

sighted a burning beacon of the Importer in evening of August 31, the derelict had a list of 33 degrees.

The Bulkhead Held

"The cause of the leak will not be definitely determined until after the vessel has been drydocked," said Captain Bissett. "We know, however, that the water entered No. 2 hold and, bursting the bulkhead, flooded the engine-room. At one time there was 26 feet of water in the engine-room and it was gaining upon us at the rate of two feet daily. We were in a precarious position, I must admit, as there was always the danger of the increased weight of water carrying away the other bulkhead, and then there is no telling what might have happened. But the bulkhead held, and here we are."

G. C. Foote, wireless operator, described his sensations when he heard searching vessels communicating with one another, himself unable to send a message:

"It was agonizing. I heard the ships report that they had abandoned hope, and that they were searching for possible survivors, and I was helpless."

Adrift in Boat

The following vessels were reported as searching for or assisting the Importer at one time or other: Cordova, Manukai, Canadian Winner, Snohomish, Algerine, Canadian Observer, and tugs Sea Lion and Sea Monarch.

While on her way to pick up the Canadian Importer, the Sea Lion found eleven members of the crew who had quit the disabled vessel August 19 to seek assistance. They had been adrift fifteen days. All were in good condition.

In connection with assertions that the Canadian Government Merchant Marine had suffered severe losses through the mishaps of the Canadian Importer, Canadian Exporter, Canadian Warrior and Canadian Recruit, the Department of Marine and Fisheries issued the following statement: "The ships of the Canadian Merchant Marine, in conjunction with the practice which obtains in other mercantile shipping offices, in every case are adequately insured." This should dispose of statements that the government was not protected against loss.

Business Improves

A marked increase in the volume of shipments, both foreign and domestic, from Pacific Coast ports was apparent during September. Underwriters generally reported more business as a result, and collections were greatly improved, one large

company having only a little more than \$10,000 outstanding.

Although practically all underwriters received more business than they had in July and August, there was divergence of opinion as to the reliance that could be placed on the change. One man phrased it as "we are definitely over the top"; while others characterized the showing as "spotty." In this they were joined by operators, who were inclined as long ago as July to doubt the trustworthiness of improvement, inasmuch as general cargo was not moving, shipments being largely lumber and seasonal goods. It is true now, also, that a great deal of freight, such as salmon, is purely seasonal; on the other hand, Japan is in a position to buy more, or at least, soon will be, in view of increased shipments of raw silk to the United States. More purchases by the United States is a necessary precedent to Japanese buying, for the excess of Japanese imports over exports during the first six months of 1921 amounted to yen 223,001,000. The aggregate of foreign trade declined 50.2 per cent from 1920.

By and large, despite the "spotty" appearance of things, the Pacific Coast's export trade appears to be well over the worst. This means more cargo insurance and improved payments of overdue hull premiums.

Alaska Suit Brought

Frank G. Germano, a passenger on the wrecked steamship Alaska, has brought suit in Portland for \$13,011.50 damages against the San Francisco & Portland Steamship Company, operator of the vessel. He charged that the captain was negligent and that the crew was incompetent. Mr. Germano's loss in money and personal effects was \$1961.50, he said.

Surviving officers of the Alaska have been exonerated by Inspectors Turner and Dolan, San Francisco. The inspectors found that each officer remained by the vessel to the end.

Captain John Alwen, master of the West Hartland, which rammed and sunk the steamship Governor in Puget Sound April 1, has brought suit in Seattle to restrain Captain William Fisher, supervising inspector, from suspending his license for two years. Captain Fisher's decision was upheld by Inspector General Uhler and Secretary of Commerce Hoover; but Captain Alwen maintains that Fisher had no legal right to consider the case independently after the local inspectors had exonerated Alwen, inasmuch as no appeal ever had been taken.

Home Capital Increased

Directors of the Home Fire & Marine Insurance Company, San Francisco, have voted to increase the capitalization from \$500,000 to \$1,000,000. The increase has been approved by the stockholders. The stock will be offered to the present stockholders, share for share, at \$25, \$10 of which will be applied to capital and \$15 to surplus. Stock not subscribed by shareholders will be taken by the Fireman's Fund, which underwrote the entire issue. By the end of the year the company will have surplus of about \$1,000,000, paid up, and more than \$4,000,000 gross assets.

J. B. Levison, president, who also is head of the Fireman's Fund, said that the time apparently had passed for the successful conduct of small companies, the best evidence of which was to be found in recent increases of capitalization, even by the largest American companies.

The Japanese Market

Marine insurance contracts, which have been on the decrease since the business slump of March last year, have begun to show an increase, says the Japan Advertiser, Tokyo. The business situation has somewhat improved since that time, as is evidenced by the increase in ocean shipments. New contracts made during January last numbered 158,374, involving a total value of yen 555,296,000, but by the end of May the respective figures had increased to 252,064 and yen 953,132,000. The increase in new contracts, however, has not been sufficient more than to offset the lapse of old contracts, with the result that the outstanding contracts show rather a decrease compared with January. The following figures give the monthly total value of new and outstanding contracts, represented in units of yen 1000:

	New Contracts	Outstanding Contracts
January	555,296	1,992,155
February	586,519	1,960,836
March	942,408	1,808,991
April	698,395	1,778,052
May	953,132	1,945,099

Marine insurance companies are considering a proposal for the acceptance of risks on fishing motor-boats. The number of such craft has considerably increased in this country of late, the present total number being about 5000, according to the Japan Marine Industry Association. Hitherto marine insurance companies have refused to take risks on these boats, which they regard as very dangerous. The own-

ers of such ships, as this sort of craft is not covered by insurance, find it difficult to obtain financial facilities on the security of their boats and they have approached the insurance companies with a request to undertake the risks. This proposal is now under consideration by the insurance firms. But it is doubtful if a favorable arrangement will result, unless the owners of fishing motor-boats are prepared to pay very high rates. Even in the case of large wooden vessels, the insurance companies refuse to take risks except in regard to those used on specially safe routes and those at rates much higher than those for ordinary steel ships.

Ship's Liability Discussed

The conference of the Maritime Law Committee of the International Law Association in London yesterday was devoted to summing up the results of discussions at the earlier sessions, said a recent issue of the London Times. On the question of whether freedom of contract on the part of the shipowners with regard to the carriage of goods by sea should be absolute, or limited by legislation, the majority of the committee favored a uniform law among maritime states for liability for losses caused by defect of ships, or default in the handling and custody of goods to be obligatory upon the shipowners. The provision was suggested that, following the Canadian statute, if the owner exercised due diligence to make the ship seaworthy and properly manned, equipped and supplied, neither the ship nor the owner, agent nor charterer should become responsible for loss or damage resulting from faults or errors in navigation, or in the management of the ship or from latent defect.

No Objection to Acknowledgment

On the question of whether legislative control should be exercised to secure for the shipper an express acknowledgment of receipt of the goods shipped, the shipowners' expressed view was that there was no objection in principle, subject to certain conditions, to a compulsory requirement of a plain bill of lading evidencing the fact of the shipment of goods specified therein.

The general view of the committee was that a basis of agreement upon a uniform system for the statutory determination of rights in respect of goods carried by sea would probably be most readily arrived at upon the lines of the Canadian statute and the report of the Imperial Shipping Committee.

MARINE INSURANCE BUSINESS TRANSACTED BY COMPANIES IN HONOLULU DURING THE YEAR 1920.

NAME OF COMPANY	Gross Risks Written	Net Risks Written	Gross Premiums Written	Net Premiums Written	Losses Paid	Losses Incurred	Premium Tax
Artes Insurance Company	\$5,413,329.00	\$1,556,151.00	\$19,149.10	\$4,235.27	\$10,868.94	\$5,904.84	\$127.23
Agricultural Insurance Company	542,560.00	372,190.00					
Alliance Insurance Company	1,962,361.00	1,869,761.00	13,700.00	12,250.00	8,431.00	3,871.86	\$277.74
American Alliance Insurance Company	2,240,327.00	1,113,524.00	11,835.34				
American Eagle Fire Insurance Company	2,160,145.00	2,304.00		498.67		301.85	169.48
American Insurance Company	1,955,635.00	395,474.00	14,558.15	2,236.00	390.43	1,267.55	72.41
Automobile Insurance Company of Hartford	2,102,110.00	1,854,959.00	23,878.72	19,795.49	2,324.49	2,324.34	444.66
Boston Insurance Company	28,300.00	37,500.00	96.35	47.50	35.28	35.39	12.12
British & Foreign Marine Insurance Company, Ltd.	3,660,667.00	3,441,877.00	34,551.87	34,211.47	1,210.00	3,367.86	79.48
Candor Fire Insurance Association	2,236,690.00	1,722,363.00	23,737.46	18,751.69	777.88	1,095.48	424.61
Canton Insurance Office, Ltd.	17,151,143.00	33,565.02	37,952.92	9,067.47	9,067.47	6,279.54	630.61
Commercial Insurance Company	750,939.00	456,138.00	6,091.43	4,510.36	566.25	912.24	101.50
Commercial Union Assurance Company, Ltd.	2,361,514.00	2,361,514.00	2,560.14	2,554.86	2,520.00	3,367.86	79.48
Columbia Fire Insurance Company	298,424.00	357,656.00	5,200.28	4,949.15	431.14	1,035.14	106.23
Continental Insurance Company	398,161.00	341,084.00	4,162.87	2,786.00	47.00	124.00	35.56
Eagle, Star & British Dominion Insurance Co., Ltd.	3,698,590.00	3,626,584.00	16,321.67	13,947.27	539.31	2,374.79	85.56
Equitable Fire & Marine Insurance Company	2,567,468.00	2,523,719.00	2,523.72				
Federal Insurance Company	596,989.00	770,514.00	39,611.60	22,928.09	16,361.72	36,361.23	517.63
Fidelity Phenix Fire Insurance Company of N. Y.	298,161.00	241,604.00	4,102.00	2,447.17	2,447.17	1,735.00	44.37
Fire Association of Philadelphia	150,541.00	101,341.00	1,385.06	490.63	2,565.00	2,565.00	113.63
Firmen's Fund Insurance Company	33,744,594.00	63,300,000.00	560,357.55	249,358.51	294,643.79	87,379.13	1,639.87
Firmen's Insurance Company	1,134,013.00	1,095,164.00	1,995.56	3,236.16	228.81	214.81	74.16
Franklin Fire Insurance Company	9,719,660.00	2,627,211.00	2,580.06	34,280.25	10,402.64	10,418.64	771.21
Gen Falls Insurance Company	251,061.00	28,948.00	3,031.74	3,517.50			79.14
Globe & Rutgers Fire Insurance Company	2,602,303.00	2,629,565.00	42,431.78	32,389.16	10,952.20	8,303.51	726.14
Great American Insurance Company	6,713,391.00	6,142,179.00	30,698.49	31,194.65	5,797.76	13,150.24	701.89
Harvest Fire Insurance Company	128,613.00	117,422.00	1,090.45	1,063.84		125.46	25.19
Hartford Fire Insurance Company	7,430,665.00	7,415,065.00	6,738.88	8,957.69	890.94	760.94	151.97
Home, Fire & Marine Insurance Company	5,736,464.00	5,736,464.00	31,338.36	29,175.15	11,115.62	5,626.62	654.69
Home Insurance Company	13,379,240.00	11,719,147.00	84,471.01	77,767.70	17,883.20	23,446.51	611.80
Hudson Insurance Company	9,660.00	9,660.00	60.77	49.97			8.80
Importers & Exporters Insurance Company of N. Y.	707,860.00	710,155.00	8,996.19	8,077.28	35.50	2,360.50	105.34
Indemnity Mutual Marine Insurance Company, Ltd.	29,900.00	40,000.00	1,000.00	1,063.84	4,399.76	4,399.76	39.27
Insurance Company of North America	9,574,730.00	8,760,042.00	190,549.97	156,100.81	79,994.92	54,788.82	1,369.72
La Foudre Marine Insurance Company	262,593.00	255,025.00	1,545.30	1,339.35	21.83		10.13
Liverpool & London & Globe Insurance Co., Ltd.	1,208,641.00	1,852,269.00	16,499.18	16,499.18			380.19
London Assurance Corporation	21,420.00	31,430.00	54.83	54.83			3.23
Marine Insurance Company, Ltd.	416,027.00	436,027.00	1,807.13	1,807.13			42.04
Massachusetts Fire Marine Insurance Company	2,661,712.00	2,661,712.00	2,661.72	4,179.44	1,005.11	2,254.10	94.46
Milwaukee Mechanics Insurance Company	1,354,314.00	1,144,856.00	4,989.41	4,179.44	1,005.11	2,254.10	94.46
National Union Fire Insurance Company	2,234,446.00	2,202,763.00	14,465.15	17,415.81	81.56	81.56	391.65
Newark Fire Insurance Company	1,022,764.00	990,461.00	2,825.33	3,052.34	1,465.49	1,125.49	114.71
Nagara Fire Insurance Company	2,569,120.00	2,569,120.00	1,760.00				
Norfolk Insurance Company, Ltd.	4,456,260.00	4,142,636.00	31,888.25	27,265.09	15,919.73	19,072.73	614.86
North China Insurance Company	98,000.00	98,000.00	3,446.86				78.43
Northwestern National Insurance Company			136.11	29.46	87.50	5.00	6.44
Phoenix Assurance Company, Ltd.	2,387,360.00	2,545,059.00	1,722.52	2,002.14	3,379.00	2,314.00	45.48
Phoenix Insurance Company	2,692,464.00	2,734,777.00	20,667.17	22,682.69	15,490.49	12,324.82	416.61
Providence Washington Insurance Company	2,321,344.00	2,629,135.00	2,629.13	15,919.73			264.39
Quetz Insurance Company of America	26,390.00	29,396.00	90.71	60.71			5.04
Queensland Insurance Company, Ltd.	2,061,539.00	1,567,571.00	9,302.20	6,941.85	2,061.77	2,061.77	134.27
Royal Exchange Assurance	691,150.00	696,667.00	1,793.13	1,295.84	8,711.73	3,232.77	97.86
Royal Insurance Company, Ltd.	243,260.00	243,260.00	1,720.18	1,720.18			24.40
Scandinavian American Assurance Corporation, Ltd.	5,695,210.00	5,017,779.00	63,880.15	56,781.95	25,568.75	30,663.77	291.58
Sea Insurance Company, Ltd.	106,250.00	106,250.00	1,062.25				21.25
Security Insurance Company	456,535.00	397,114.00	1,285.97	5,599.99	75.30	45.00	146.28
Standard Marine Insurance Company	16,460,325.00	11,697,713.00	96,980.27	61,736.62	14,623.40	4,336.76	1,369.58
St. Paul Fire & Marine Insurance Company	5,069,768.00	2,890,119.00	11,045.00	16,974.73	21,488.25	31,274.36	590.00
Swiss General Insurance Company, Ltd.	8,628,950.00	8,564,177.00	86,439.32	2,474.25	1,124.04	1,124.04	569.71
Thames & Mersey Marine Insurance Company	3,047,690.00	5,347,891.00	26,364.76	27,075.40	11,194.53	11,194.53	609.02
Tokio Marine & Fire Insurance Company	1,596,706.00	1,536,166.00	4,586.83	1,372.50	4,251.23	4,408.00	96.91
Union Marine Insurance Company, Ltd.	297,560.00	297,560.00	1,887.46	1,826.06	417.10	417.10	41.13
United States Fire Insurance Company	1,361,480.00	1,054,467.00	8,880.66	6,995.28	2,556.78	2,769.00	338.42
United States Lloyd's, Inc.	589,065.00	529,005.00	7,807.98	8,849.81	3,976.77	4,445.54	135.76
Vulcan Fire Insurance Company	739,650.00	739,650.00	1,177.84	8,177.84	4,983.45	2,560.64	134.00
Westchester Fire Insurance Company	2,107,475.00	1,166,877.00	30,896.56	8,719.78	3,668.82	3,362.82	146.90
Western Assurance Company	2,000,000.00	2,000,000.00	2,000.00	2,000.00	4,300.00	4,300.00	445.00
Yangtze Insurance Association, Ltd.	17,172,173.00	11,006,969.00	126,666.00	85,256.16	2,960.69	10,400.47	1,736.70
Totals	\$288,776,219.00	\$226,579,165.00	\$1,912,777.90	\$1,316,328.17	\$646,698.60	\$365,520.04	\$127,187.91

Mr. Edward F. Nicholls, representing the underwriters, emphasized the absolute necessity in the interests of overseas commerce of ability on the part of shipowners to limit in clear terms the liabilities incurred by them by means of the contract of affreightment.

It was decided to refer the following questions to the conference of the International Law Association, to be held at the Hague in September:

(1) Whether it is desirable in the interests of seaborne trade that the rights and liabilities of the cargo owner and shipowner under all contracts for the carriage of goods by

sea should be controlled by state action.

(2) If so, to what extent.

The preparation of a draft code of regulations embodying the views expressed by the majority at the meetings of the conference was referred to a drafting committee.

New Honolulu Agency

Fred L. Waldron, Ltd., a shipping and commission house of Honolulu, has added an insurance department in charge of J. G. Zabriskie, formerly of C. Brewer & Company and Alexander & Baldwin. The Waldron company will represent the Yangtze Insurance Association in the marine field, and the Royal Exchange

Assurance of London in fire and automobile.

T. J. Byrnes, secretary of the Universal Insurance Company and also of Talbot, Bird & Company, is making a visit to the Pacific Coast.

The O. S. K. steamship Shoshu Maru, of 1532 tons gross, built at Glasgow in 1891, struck in the Loochoo Islands in a typhoon August 12 and was lost with all hands except one man who had attempted to summon assistance from shore. Forty-four men perished. Loss of vessel and cargo is estimated at five hundred thousand dollars.

In the Shipyards

New Construction

A model of a proposed combination vessel for the Inter-Island Steam Navigation Company of Honolulu will be towed in the University of Michigan tank about October 1. If the test be satisfactory, the plans will be completed in detail and sent to Honolulu for final approval. It is possible that there will be some delay in calling for bids, but there appears to be no doubt whatever that the vessel will be built. Keen competition for the contract is in the offing. Due to the desire of the company to have the steamer built on the Pacific Coast, where supervision will be easier and where builders are better acquainted with the needs of the Hawaiian service, Western builders will have an advantage over their Eastern competitors. A yard unacquainted with the demands of the Hawaiian service might follow specifications to the letter and still produce a vessel unsatisfactory in some respects; therein lies the strength of the West, but if bids of the Pacific are too high the contract will go East.

The Puget Sound Navigation Company, Seattle, is reported to be planning a \$500,000, 19-knot steel ferry for its Seattle-Bremerton service, construction to be begun in 1922.

Red D Bids Low

Ten bids were received by the Red D Line July 18 for the construction of two 4300 deadweight ton combination vessels for the New York-Venezuela service. Bids ranged from \$1,100,000 to \$1,800,000 a vessel, which appear to be quite low.

"It is said that the present actual cost of the ship, without making any allowance for overhead expense, is somewhere around \$1,400,000," says the Atlantic Coast Shipbuilders' Association. "The shipbuilding yards, facing a shutdown unless further orders are forthcoming, are anxious to keep their organizations together and are showing a disposition to accept contracts at cost."

Bids have been asked by the Western Union from British and French as well as American yards for the construction of a Diesel-electric cable ship.

Several grain barges and carfloats may be built by the New York Central Railroad for New York harbor work.

Bids have been asked for the construction of two ferries and slips for the Philadelphia & Camden Ferry Company. If costs of construc-

tion are not too high a contract will be placed.

Contracts Let

The Vineyard Shipbuilding Company, Milford, Delaware, is reported to have received a contract from the government of Bahama for the construction of a combination tug, tender and dispatch boat, 120 feet L. O. A., 28 broad, 10 deep, of wood, equipped with a 500 I. H. P., fore and aft compound engine and one Scotch boiler.

The Midland Range Company, Midland, Pennsylvania, is said to have been awarded contracts by the United States Engineers' office, Nashville, for the construction of two steel barges to cost \$13,880 each.

The Newburgh Shipyards, Inc., with a price of \$10,257, is reported to be the low bidder for the supplying of fifteen bell buoys, fixed counterweights with bell, for the Department of Commerce, lighthouse service, Tompkinsville, New York.

A contract for three steel deck barges, 120x32x7 feet, to be constructed for the United States Engineers, Pittsburgh, has been awarded to the Dravo Contracting Company September 2. Of ten bids submitted by various companies for the work, the Dravo company's was lowest at \$13,425 a barge.

Last U. S. S. B. Freighter

The Los Angeles Shipbuilding & Drydock Company launched its thirty-fifth and last steel freighter for the United States Shipping Board September 19. She was christened West Chopaka by Mrs. Fred L. Baker, wife of the president of the company. Five of the vessels, the West Chopaka included, were 11,000-ton flush-deck freighters; the others were 8800-tonners. The Los Angeles yard received the first contract of the Shipping Board's program, the document having been executed May 13, 1917, and the same company now has launched the last freighter for the board.

Oriental Line Planned

Following the launching, the company's guests were taken on a cruise around Catalina Island on the steamship Harvard. During the cruise Mr. Baker and Erle M. Leaf, vice-president of the Los Angeles yard and secretary of the Los Angeles Steamship Company, of which Mr. Baker is president, held a meeting with several prominent guests to discuss with Meyer Lissner, Shipping Board commissioner, plans for the formation of an Oriental steam-

ship line for freight and passenger service. Plans are taking shape, it is stated, with the aim of making the Los Angeles Steamship Company, operator of the Yale and Harvard, the nucleus of a large organization, which should open an Oriental service on the ground prepared by the Los Angeles Pacific Navigation Company, formerly an operator of Shipping Board tonnage. Messrs. Baker and Leaf were the chief executive officers of this last-named corporation.

Although the West Chopaka is the last vessel under construction, the Los Angeles Shipbuilding & Drydock Company will remain in business as a drydocking and repair plant, following upon the original plans of Messrs. Baker and Leaf.

The West Chopaka launching was the last of any freighter building for the Shipping Board. One passenger vessel, the Nutmeg State, remained on the ways at Sparrows Point, Bethlehem, September 1.

Work at Shanghai

Kiangnan, Shanghai, expected to dispatch the third 10,000-ton freighter, the Oriental, to the United States in late September. One vessel, the Cathay, remains building for the Shipping Board. Her keel was laid April 5, 1919, and she was launched May 26, 1921. The date of keel-laying may have some bearing on the point raised in Pacific Marine Review last month, as to whether she and her sisters were owned by the United States at the time of passage of the Merchant Marine Act.

Authoritative information from Washington is to the effect that small appropriations will not result in delay to new Shipping Board construction or in payments for vessels already delivered.

Pacific Building

On September 1, according to returns compiled by Pacific Marine Review, there were 13 ocean-going steel merchant vessels of 162,490 deadweight tons under construction in yards of the Pacific Coast of the United States. Four vessels of 37,800 tons were delivered in August as follows: freighter, Shipping Board, 1 of 11,000 tons; tanker for Shipping Board, 1 of 10,000 tons; tankers for foreign private account, 2 of 16,800 tons. No contracts have been let.

Active construction will continue on the Pacific Coast longer than had been expected, for work on most of the vessels is not being pushed at the former rate. This is due largely to the falling-off in the demand for tankers.

Canada delivered one vessel of 8390 tons to the Canadian Government Merchant Marine in August.

The following tabulation is of work under way September 1:

	No.	Agg'te
American Yards	Vessels	D.W.
Freighters, U.S.S.B.	2	22,000
Tankers, private	7	83,690
Freighters, private	2	40,000
Tankers, foreign	2	16,800
Totals	13	162,490
Canadian Yards		
Freighters, Gov't	3	25,090
Comb'n, private	1	600
Totals	4	25,690

World Building

The world's merchant shipping in June, 1921, as reported by Lloyd's Register, comprises 33,206 vessels of 100 gross tons or over, aggregating 61,974,653 gross tons, the returns covering a considerable number of vessels on which work has begun but is not yet completed. The corresponding returns in June, 1920, reported 31,595 vessels of 57,314,065 gross tons. The accompanying table is a summary according to nationality, the last item, "flags not recorded," comprising former German steamers not yet definitely allocated among the allied nations and various other ships.

Different sets of figures have been compiled to show the increase in the world's shipping since 1914. One statement puts the net increase at 11,703,000 gross tons of steel and iron steam vessels, of which the United Kingdom had 411,000 tons; the United States, 10,477,000; other countries, 6,311,000; less a German loss of 4,444,000 and Austro-Hungarian of 1,052,000. Another tabulation shows a net increase of 12,779,944 gross. Lloyd's statistics show, however, that there is 5,757,175 gross tons of steel steamers at least twenty-five years old. If this aggregate and 2,940,000 tons of new tankers is deducted from the increase, the growth of the cargo fleet proper is seen to be about 3,000,000 tons. But the normal growth prior to 1914 was 2,000,000 gross tons a year, whence the optimists deduce that, aside from trade depression, there is an actual shortage of shipping.

Shipping Board Work

On July 1 the status of Shipping Board tonnage was:

	No.	D.W. Tons
Keels to be laid	0	0
Ships on ways	4	48,000
Ships outfitting	20	228,800
Ships delivered	2288	13,359,911
Totals	2312	13,636,711

Country.	Steamers and motor vessels.		Sailing vessels.		Grand total.	
	Number.	Gross tonnage.	Number.	Gross tonnage.	Number.	Gross tonnage.
British:						
United Kingdom	8,479	10,320,053	455	261,501	8,934	10,581,554
Australia and New Zealand	570	672,146	45	21,791	615	693,937
Canada	541	835,275	348	153,090	889	970,355
Lake	72	163,756			72	163,756
India and Ceylon	147	196,804	43	10,483	190	187,289
Other dominions	415	410,492	218	65,353	633	475,847
Total	10,324	21,568,066	1,109	482,192	11,433	22,070,798
United States:						
Sea	3,779	13,511,112	1,179	1,183,946	4,958	14,697,088
Northern Lakes	495	2,163,144	26	19,798	494	2,254,920
Philippine Islands	66	72,098	3	1,890	99	73,984
Total	4,343	15,746,354	1,208	1,273,618	5,551	17,020,002
Argentine	163	145,891	46	21,333	209	167,151
Belgian	253	546,641	3	4,390	256	551,031
Brazilian	351	470,436	51	22,860	402	490,255
Chilean	101	99,567	23	13,880	124	113,447
Chinese	122	165,017			122	165,017
Cuban	41	50,178	15	8,271	56	58,553
Danish	567	803,052	211	81,412	798	964,461
Dutch	1,047	2,308,433	65	17,354	1,090	2,525,787
Estonian	35	20,779	55	11,491	90	40,183
Finnish	145	106,255	155	92,097	330	198,352
French	1,652	3,296,785	382	333,454	2,044	3,630,249
German	1,040	651,497	165	62,963	1,255	717,459
Greek	312	587,250	30	12,679	362	600,929
Italian	850	2,497,537	378	150,008	1,228	2,647,545
Japanese	2,633	3,354,805			2,633	3,354,805
Latvian	43	40,062	56	13,390	99	53,452
Norwegian	1,730	2,371,011	139	213,977	1,869	2,584,988
Peruvian	28	57,175	10	26,691	68	83,867
Portuguese	158	230,121	126	66,726	281	296,817
Rumanian	37	73,973			37	73,973
Russian	450	405,676	15	7,763	465	413,519
Spanish	600	1,111,552	139	53,978	739	1,165,531
Swedish	1,125	1,063,918	73	24,227	1,233	1,088,211
Uruguayan	49	73,191	14	12,752	63	85,943
Other countries	270	227,263	31	11,242	301	212,765
Flag not recorded	571	764,398	46	16,893	617	781,291
Total	28,433	58,846,325	4,773	3,128,328	33,206	61,974,653

World's merchant shipping in June, 1921

The output of United States yards in the last twelve fiscal years has been:

Fiscal Year	D. W. Tons
1910	513,102
1911	436,743
1912	349,003
1913	519,232
1914	474,375
1915	337,683
1916	488,119
1917	996,718
1918	1,951,302
1919	4,989,931
1920	5,694,567
1921	2,863,465

Japanese Strike Over

As most strikes made during business depression are likely to do, the great shipyard strike of Kobe has resulted in a definite defeat of the men. They have returned to work, unquestionably beaten this time, but having learned the valuable lesson that there is nothing sacred about the Japanese industrial system and that Fuji is not likely to erupt merely because a few thousand human beings chose to quit work for a month or so. Considered in this light the strike is a victory for the men of Kobe and for employers and workmen of all the world, who have

the greatest interest in seeing Japanese costs of production brought to a higher level. That the strikers appreciated the truth of things is disclosed by the following quotation from a statement issued when they trudged back to forge and hammer: "We have resolved to return to work, but we have not abandoned the cause for which we declared the strike. . . The near future shall see us in the enjoyment of rights obtained by our real power from our employers." The statement continues to say that the danger to which the strike exposed shipbuilding impelled a return to work, and then lets the cat out of the bag by adding: "The realization of the increasing misery to which we have brought our families has also contributed to aid in ending the strike." Success in strikes requires a fund; a fund is difficult to raise when a day's wages is low; yet a beginning has been made, to which the future will bear witness.

A digest of the last few weeks of the strike follows:

July 29—Serious riots at Kawasaki yard. Police use sabers, injuring many.

July 30—Police raid homes of agitators, arresting 300. Another riot.

August 2—Kawasaki officials decline to accept mediation, preferring to deal directly with men. More men return to work.

August 5—Mitsubishi against mediation or recognition of union.

August 6—Mitsubishi workmen protest against mediation.

August 7—Men decide to return to work, but refuse to concede defeat.

August 12—Fujiyagata yard, Osa-

ka, adopts system of joint control, the first in Japan to do so.

August 16—Sumitomo company's manufacturing plants adopt shop-committee system. The committee of each plant is to be one of investigation only, without power to enforce its rulings, although it may take the initiative in considering questions as well as discussing those referred to it by the management.

Progress of Work

Pacific Launchings

UNITED STATES

West Chopaka, 11,000 D.W.T. cargo U.S.S.B., Los Angeles Shipbuilding & Drydock Company, September 19.

La Purisima, 7500 D.W.T. tanker Union Oil Company, Southwestern Shipbuilding Company, September 10.

Mojave, Coast Guard cutter, Union Construction Company, September 7.

CANADIAN

Canadian Transporter, 8350 D.W.T. cargo C.G.M.M., J. Coughlan & Sons, August 31.

Princess Louise, 4300 gross combination C.P.O.S., Wallace Shipbuilding & Drydock Company, August 29.

Eastern Launchings

UNITED STATES

Knoxville City, 6400 gross cargo U.S. Steel, Chickasaw Shipbuilding & Car Company, August 6.

S-51, Submarine U.S.N., Lake Torpedo Boat Company, August 20.

Washington, battleship U.S.N., New York Shipbuilding Corporation, September 1.

Steel derrick boat for Allegheny, Monongahela and Ohio river service, Dravo Contracting Company, August 19.

John D. Archbold, 20,300 D.W.T. tanker Standard Oil of New Jersey, Newport News Shipbuilding & Drydock Company, August 20.

Chattanooga City, 6400 gross cargo U.S. Steel, Chickasaw Shipbuilding & Car Company, September 12.

Pacific Deliveries

UNITED STATES

West Greylock, 11,000 D.W.T. cargo U.S.S.B., Los Angeles Shipbuilding & Drydock Company, August 29.

Tamiahua, 16,340 D.W.T. tanker Southern Pacific Atlantic Lines, Moore Shipbuilding Company, September 23.

Tampa, Coast Guard cutter, Union Construction Company, September 15.

CANADIAN

Canadian Scottish, 8390 D.W.T. cargo C.G.M.M., Prince Rupert Drydock & Shipbuilding Company, August.

Eastern Deliveries

UNITED STATES

Three car-boats, American Bridge Company.

Pecos, fuel-ship U.S.N., Boston Navy Yard, commissioned August 25, delivered September 15.

Yankee Arrow, 12,500 D.W.T. tanker Standard Transport, New York Shipbuilding Corporation, August 2.

Six barges, builders' account, Doulut & Williams Shipbuilding Company.

CANADIAN

Topdalsfjord, 6400 D.W.T. cargo Norwegian-America Line, Canadian Vickers, July 22.

Atlantic Keel-layings

UNITED STATES

Fireboat City of Philadelphia, Merchant Shipbuilding Corporation, September 15.

Kamoi, fuel ship Japanese navy, New York Shipbuilding Corporation, September 14.

Pacific Coast, United States

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Potrero Works

Purchasing Agent: O. W. Street. Submarines USN: S-31, hull 136; S-32, hull 137; S-33, hull 138; S-34, hull 139; S-35, hull 140; S-36, hull 141; S-37, hull 142; S-38, hull 143; S-39, hull 144; S-40, hull 145; S-41, hull 146; all launched; outfitting proceeding slowly.

Alameda Works

Chilore, hull 5309, combination ore and coal carrier Ore Steamship Co; 571-6 LOA; 550-1 LBP; 72 molded beam; 44 molded depth; 32-4 loaded draft; 11½ loaded speed; 20,000 DWT; Curtis turbines with Falk reduction gears, 5000 SHP; 3 Scotch SE boilers, 17-6x12, each 4287 sq ft; oil burners.

Lebore, hull 5310, combination ore and coal carrier Ore Steamship Co; sister to above.

F. H. Hillman, hull 5311, tanker Standard Oil Co of Cal; 500 LBP; 68 beam; 25-11 loaded draft; 11 loaded speed; 15,000 DWT; rec engs, 4000 IHP; 3 Scotch marine boilers, 16x12-9; keel Jan10/21; launch July28/21; deliver Oct15/21, east.

H. M. Storey, hull 5312, tanker

Hillman; keel Jan19/21; launch Sept 28/21, east.

W. S. Rheem, hull 5313, tanker Standard Oil Co of Cal; sister to F. H. Hillman; keel Mar1/21; launch Nov 10/21, east.

No name, hull 5314, ferryboat Six Minute Ferry Co; 230 LOA; 63-6 beam over guards, 42 molded; 19-6 molded depth; TE eng, 1400 IHP; propeller drive; 3 WT boilers.

No name, hull 5315, ferryboat Six Minute Ferry Co; sister to above.

HANLON DRYDOCK & SHIPBUILDING CO., OAKLAND

Purchasing Agent: R. Barker.

Dan F. Hanlon, hull 89, steam schr. D. J. Hanlon; 2500 DWT; 1400 IHP engines; 2 B&W boilers.

LOS ANGELES SHIPBUILDING & DRYDOCK CO., SAN PEDRO

West Greylock, hull 33, steel cargo USSB; 430 LBP; 54 beam; 28-2 loaded draft; 10½ loaded speed; 11,000 DWT; TE engs, 3500 IHP; 3 Scotch single end, 15-9; keel Nov10/20; launch June21; deliver Aug29/21.

West Prospect, hull 34, steel cargo USSB; sister to above; keel Dec31/20; launch July30/21; deliver Sept 30/21, east.

West Chopaka, hull 35, steel cargo USSB; sister to above; keel Feb24/21; launch Sept19/21; deliver Nov 25/21, east.

MOORE SHIPBUILDING COMPANY, OAKLAND

Purchasing Agent: W. E. Hostetter.

H. T. Harper, hull 163, tanker Standard Oil Co of California; 330 LBP; 46 beam; 21-6 loaded draft; 4750 DWT; Skandia Diesel engs; keel Oct20; launch June16/21; deliver Oct1/21, east.

Tamiahua, hull 165, tanker S. P. Atlantic S S Co; 520 LBP; 71 beam; 28 loaded draft; 16,340 DWT; rec engs; 3 Scotch boilers, 15-9x12; keel Feb28/21; launch July2/21; deliver Sept23/21.

Birkenhead, hull 166, tanker for Vacuum Oil Co; 425 LBP; 67 beam; 26-3 loaded draft; 10,100 DWT; rec engs; 3 Scotch marine boilers, 15-2x12; keel Dec9/20; launch July9/21; deliver Oct1/21, east.

NAVY YARD, PUGET SOUND

Medusa, repair ship for government; 460 LBP; 70 beam; about 19 loaded draft; 17-5 loaded speed; turbine eng, 7000 IHP; 2 WT express type boilers; 10,000 tons disp; keel Jan2/20; launch and deliver dates not set.

Holland, submarine tender for government; 460 LBP; 61 beam; about 20 loaded draft; 16 K loaded speed; turbine eng, 7000 IHP; two WT express type boilers; 10,000 tons disp; keel April1/21.

NAVY YARD, MARE ISLAND

Montana, battleship USN; 680 LB P; 105 beam; 33 loaded draft; 23 loaded speed; 42,200 disp; turbo-electric engs, 60,000 SHP; 12 Bu's express boilers, 74,040 sq ft; keel Sept 1/20; work suspended.

Wasmuth, destroyer USN; 310 LB P; 30-11½ beam; 9-4 loaded draft; 35 loaded speed; 1215 disp; geared turbine eng, 26,000 SHP; 4 Normand boilers, 27,000 sq ft; keel Aug12/19; launch Sept15/20.

Trever, destroyer USN; sister to above; keel Aug12/19; launch Sept 15/20.

Perry, destroyer USN; sister to above; keel Sept15/20.

Decatur, destroyer USN; sister to above; keel Sept15/20.

SOUTHWESTERN SHIPBUILDING CO., EAST SAN PEDRO

Purchasing Agent: J. J. Wilson.
La Purisima, hull 23, Isherwood tanker Union Oil Co; 392 LBP; 51 beam; 23-11 loaded draft; 11½ loaded speed; 7500 DWT; TE engs, 2800 IHP; 3 Scotch boilers, 14x12; keel Dec22/20; launch Sept10/21; deliver Oct/21, est.

Semiramis, hull 26, Isherwood tanker Nederlandsch-Indische Tankstoomboot Maatschappij; 412 LBP; 53 beam; 24-7 loaded draft; 11 loaded speed; 8400 DWT; TE engs, 2700 IHP; 3 Scotch boilers, 15-6 x 11-7; keel Nov5/20; launch Aug6/21; deliver Sept/21, est.

TODD DRYDOCK & CONSTRUCTION CORP., TACOMA

Purchasing Agent: C. L. Bankson.
Omaha, hull 100, scout cruiser USN; 555-6 LOA; 550 LBP; extreme beam 55-4; molded beam 54-9; depth molded 26; mean loaded draft 13-6; disp 7100 tons; Westinghouse Parsons turbines and reduction gear, 105,000 IHP; designated speed 34; 12 Yarrows WT boilers; keel Dec6/18; launch Dec14/20.

Milwaukee, hull 106, scout cruiser USN; sister to above; keel Dec13/18; launch Mar24/21.

Cincinnati, hull 107, scout cruiser USN; sister to above; keel May15/20; launch May23/21.

UNION CONSTRUCTION CO., OAKLAND

Purchasing Agent: A. J. Farnsworth.

Tampa, hull 16, cutter USCG; 240 LOA; 39 beam; 14 loaded draft; 16 loaded speed; 1600 DWT; turbo-electric engs, 2600 IHP; 2 WT boilers; keel Sept27/20; launch April6/21; deliver Sept15/21.

Haida, hull 17, cutter for USCG; same as the above; keel Sept27/20; launch April9/21; deliver Oct15/21, est.

Mojave, hull 18, cutter USCG; same as the above; keel April6/21; launch Sept7/21.

Modoc, hull 19, cutter USCG; same as above; keel April9/21; launch Oct1/21, est.

Shawnee, hull 20, cutter USCG; 150 LOA; 30 beam; 13-6 loaded draft; 12½ loaded speed; 1000 DWT; TE engs, 1000 IHP; 2 WT boilers; keel June1/21.

Amalthus, hull 23, oil tanker Anglo-Saxon Pet Corp, Ltd; 412 LBP; 53-6 beam; 24-9 loaded draft; 11

loaded speed; 8400 DWT; rec engs, 2600 IHP; 3 Scotch marine boilers, 15-6x11-7; keel Mar12/21; launch Aug11/21.

All cutters on transverse system; others on Isherwood system.

Canadian

CHOLBERG SHIPYARD, VANCOUVER, B. C.

Purchasing Agent: W. Meed.
(These vessels to be completed by Dominion government.)

Sir Henry Drayton, hull 5, 4-masted barkentine Victoria Shipowners, Ltd; 250 LOA; 45-6 beam; 21-10 loaded draft; 2400 DWT; sailing vessel; shaft logs fitted for auxiliary but no machinery installed; keel May 15/20.

No name, hull 6, 4-masted barkentine Victoria Shipowners, Ltd; sister to above; keel June4/20.

No name, hull 7, 4-masted barkentine Victoria Shipowners, Ltd; sister to above; keel Feb/21.

J. COUGHLAN & SONS, LTD. VANCOUVER, B. C.

Purchasing Agent: J. Joseph.
Canadian Transporter, hull 20, steel freighter Canadian government; 400 LBP; 52 beam; 25-3 loaded draft; 11½ loaded speed; 8350 DWT; TE eng, 3000 IHP; 3 Scotch boilers, 15-6 x 11-6; keel Jan6/21; launch Aug31/21.

Canadian Freighter, hull 21, steel freighter Canadian government; sister to above; keel Jan6/21.

PRINCE RUPERT DRYDOCK & ENGINEERING COMPANY, PRINCE RUPERT

Canadian Scottish, steel cargo Canadian government; 8390 DWT; 2-deck; bridge, poop and forecastle; 11 speed; keel Sept27/19; launch May17/21; deliver Aug/21.

Canadian English, steel cargo Canadian government; 8390 DWT; 2-deck; bridge, poop and forecastle; 11 speed; keel Oct20/19.

These vessels are being completed by the Wallace Shipbuilding & Drydock Co, North Vancouver. The terms are time and material plus 8 per cent.

WALLACE SHIPBUILDING & DRYDOCK CO., VANCOUVER, B. C.

Princess Louise, Canadian Pacific; 317 LBP; 45 beam; 18½ deep; 16 knots; single-screw; 600 tons cargo space; accommodations for 200 passengers; keel Oct 20; launch Aug 29/21.

Atlantic and Gulf

AMERICAN BRIDGE COMPANY, PITTSBURGH, PENN.

Purchasing Agent: W. G. A. Millar.
Twenty-five coal barges Carnegie Steel Co; 175 LBP; 26 beam; 8 loaded draft; 19 launched.

Three car floats undisclosed interests; 285 LBP; 38 beam; 8 loaded draft; all delivered.

Two tow boat hulls Carnegie Steel

Co; 149-2x34 4-5 loaded draft; launch and deliver Oct/21.

BALTIMORE DRYDOCKS & SHIPBUILDING CO., BALTIMORE

A. G. Crosby, assistant general manager in charge of purchases.

Hull 125, tanker builder's account; 340 LBP; 49 beam; 23-6 loaded draft; 10 loaded speed; 6000 DWT; rec. eng, 2000 IHP; 2 Scotch boilers, 15-3; keel Nov24/20; about 70 per cent comp Sept/21.

Hull 126, tanker builder's account; 430 LBP; 59 beam; 25-4½ loaded draft; 10 loaded speed; 10,250 DWT; turb eng, 3000 IHP; 3 Scotch boilers, 15-3; keel Sept27/20; about 85 per cent comp Sept/21.

Hull 128, fireboat City of Baltimore; 115-6 LBP; 28 beam; 9-6 loaded draft; 12 loaded speed; rec eng, 1000 IHP; 2 B&W WT boilers; keel July15/21; about 45 per cent comp Sept/21.

BETHEHEM SHIPBUILDING CORP., FORE RIVER PLANT, QUINCY, MASS.

Lexington, hull 1300, battle-cruiser USN.

Raleigh, hull 1382, scout cruiser USN.

Detroit, hull 1383, scout cruiser USN.

Massachusetts, hull 1400, battle-ship USN.

And the following nineteen submarines USN: AA-2, hull 1270; hulls 1309 to 1320 inc, submarines S-18 to S-29 inc; hulls 1389 to 1394 inc; submarines S-42 to S-47 inc.

J. Fletcher Farrell, hull 1496, tanker Sinclair Nav Co; 430 LBP; 59 beam; 25-5 loaded draft; 11 loaded speed; 10,600 DWT; rec eng, 3200 IHP; 3 Scotch boilers, 15x11-9; launch June10/21.

William Boyce Thompson, tanker Sinclair Nav Co; sister to above; keel Nov11/21; launch July/21.

BETHEHEM SHIPBUILDING CORP., HARLAN PLANT, WILMINGTON, DEL.

No name, hull 3477, tanker Atlantic Refining Co; 266 LBP; 39 beam; 17 loaded draft; 8½ loaded speed; 2600 DWT; turb eng, 750 IHP; B & W boilers; keel not laid.

BETHEHEM SHIPBLDG. CORP., SPARROWS POINT PLANT, SPARROWS POINT, MD.

Pine Tree State, hull 4195, combination USSB; 518 LBP; 72 beam; 30-7 loaded draft; 16 loaded speed; turb eng, 10,000 IHP; 3 Yarrows boilers; keel Feb15/19; launch Mar 19/21.

Palmetto State, hull 4196; combination USSB; sister to above; keel Feb19/19; launch June4/21.

Nutmeg State, hull 4197, combination USSB; sister to above; keel July29/20.

G. Harrison Smith, hull 4210, ore and oil Internat'l Pet Co; 550 LBP;

72 beam; 32-4 loaded draft; 11½ loaded speed; 20,000 DWT; rec eng 4600 IHP; 3 Scotch boilers, 17-6x12; keel July22/20; launch July12/21.

Bethore, hull 4211, ore and oil Ore SS Co; sister to above; keel Feb24/21.

Marore, hull 4212, ore and oil Ore SS Co; sister to above, except turb eng; keel May2/21.

Steelore, hull 4213, ore and oil Ore SS Co; sister to above; keel not laid.

CONSOLIDATED SHIPBUILDING CORPORATION, MORRIS HEIGHTS, N. Y.

Purchasing Agent: Wm. Rayner. Oak, hull 251, US lightship tender; 160 LOA; 30 beam; 9-6 loaded draft; 875 DWT; TE eng, 700 IHP; 1 Scotch boiler, 14 diam; keel Nov 22/20; launch June18/21.

Hawthorn, hull 252, US lightship tender; sister to above; keel Nov 22/20; launch June28/21.

No name, hull 246, US lightship; 146-3 LOA; 30 beam; 12-7 loaded draft; 825 DWT; comp eng, 400 IHP; 2 Scotch boilers, 10-6 diam; keel Mar4/21.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO., PHILADELPHIA

Purchasing Agent: Ed. C. Geehr. Richmond, hull 448, scout cruiser USN; keel Feb16/20; launch Sept 29/21, est; 70 per cent comp Sept1.

Concord, hull 449, scout cruiser USN; keel Mar29/20; launch Nov 29/21, est; 66 per cent comp Sept1.

Trenton, hull 501, scout cruiser USN; keel Aug18/20; launch Dec 1/22, est; 50 per cent comp Sept1.

Marblehead, hull 502, scout cruiser USN; keel Aug4/20; launch Feb 1/23, est; 46 per cent comp Sept1.

Memphis, hull 503, scout cruiser USN; keel Oct14/20; launch Jan1 /23, est; 40 per cent comp Sept1.

OSCAR DANIELS COMPANY, TAMPA, FLORIDA

B. D. Benson, hull 11, Isherwood tanker Standard Oil; 466 LBP; 60 beam; 26-7 loaded draft; 10½ loaded speed; 11,900 DWT; QE eng, 2800 IHP; 3 Scotch boilers, 15x11-6; keel June29/20; launch April5/21.

T. J. Williams, hull 12, Isherwood tanker Standard Oil; sister to above; keel Aug11/20; launch May3/21; deliver Aug15/21 est.

DOULLUT & WILLIAMS SHIP-BUILDING COMPANY, NEW ORLEANS

Purchasing Agent: Roland A. Thomas.

Six oil-carrying steel barges for builder's account; 40x175x5; 1000 DWT; two launched in July; four in August; no heating coils; piping or propelling machinery; all completed.

FEDERAL SHIPBUILDING CO., KEARNY, N. J.

Purchasing Agent: J. L. Hastings.

Steel Seafarer, hull 43, freighter US Steel Products Co; 425 LBP; 56 beam; 25-10 loaded draft; 12 loaded speed; 9400 DWT; turb engs, 3100 IHP; 3 Scotch boilers, 15 diam; keel May25/21; launch Oct15/21, est; deliver Nov5/21, est.

Steel Pathfinder, hull 44, freighter US Steel Products Co; sister to the above; keel June1/21; launch Nov 12/21, est; deliver Dec3/21, est.

Steel Pioneer, hull 45, freighter US Steel Products Co; sister to the above; keel July/21; launch Dec10/21, est; deliver Dec31/21, est.

GLOBE SHIPBUILDING & DRY-DOCK CO. OF MARYLAND, BALTIMORE

Purchasing Agent: H. B. McCauley. San Leopoldo, hull 101, oil carrier Eagle Oil Transport Co; 401 LBP; 54 beam; 25-1 loaded draft; 10½ loaded speed; 8600 DWT; TE engs, 2800 IHP; 3 Scotch boilers, 15-3x11-6; keel Sept/20; launch June25/21.

San Leonardo, hull 102, oil carrier Eagle Oil Transport Co; sister to above; keel Sept/20; launch July8/21.

LAKE TORPEDO BOAT CO., BRIDGEPORT, CONN.

Purchasing Agent: H. A. Maxfield. S-48, hull 48, submarine USN; launch Feb26/21.

S-49, hull 49, submarine USN; launch Apr23/21.

S-50, hull 50, submarine USN; launch June18/21.

S-51, hull 51, submarine USN; launch Aug20/21.

MERCHANT SHIPBUILDING CORPORATION, CHESTER, PENN.

Vice-President: J. L. Ackerson.

Robert E. Hopkins, hull 385, tanker Tidewater Oil Co; 424 LBP; 58 beam; 25-5 loaded draft; 10½ loaded speed; 10,000 DWT; TE engs; 3 Scotch boilers, 15-3x11-7; keel Aug 30/20; launch Aug6/21; deliver Sept 30/21, est.

Samuel Q. Brown, hull 384, tanker Tidewater Oil Co; sister to above; keel Oct1/20; launch Oct8/21, est.

No name, hull 385, freighter American-Hawaiian SS Co; 445 LBP; 59-8 beam; 28-6 loaded draft; 11½ speed; 11,000 DWT; 2 6cyl, 4-cycle Diesel engs, 4500 metric; 1 vertical donkey, 400 sq ft HS; keel Feb5/21.

No name, hull 386, freighter American-Hawaiian SS Co; sister to above; keel Feb10/21.

No name, hull 387, fireboat City of Philadelphia; 120-9 LOA; 28 beam; 12-9 deep; 9 loaded draft; comp eng, 500 IHP; 2 B&W WT boilers, oil; 4 turbine fire pumps; 1 30-foot tower, 2 15-foot towers; capacity 12,000 gals a minute; keel Sept 15/21.

NAVY YARD, BOSTON

Pecos, fuel ship No. 18, USN; 455 LBP; 56-2 beam; 26-8 normal draft; 14 loaded speed; 14,800 nor-

mal disp; rec eng, 5200 IHP; 4 Ward WT boilers; keel June2/20; launch Apr23/21; comm Aug25/21; deliver Sept15/21.

Whitney, destroyer tender No. 4 USN; 460 LBP; 60-11 beam; 21 normal draft; 16 loaded speed; 10,600 normal disp; geared Parsons turbs, 7000 SHP; 2 WT exp small tube boilers; keel Apr23/21; launching indefinite.

NAVY YARD, PHILADELPHIA

Dobbin, hull 7, destroyer tender USN; 460 LBP; 60-10 beam; 21 loaded draft; 16 loaded speed; 10,600 tons disp; Parsons geared turb single screw engs, 7000 SHP; 2 WT boilers; keel Dec23/19; launch May 5/21; deliver date not determined.

Constitution, hull 8, battle cruiser USN; 850 LBP; 105-4 beam; 30-11½ loaded draft; 33½ loaded speed; 43,500 disp; electric drive, 180,000 SHP; 16 WT boilers; keel Sept 25/20; launch and deliver dates not determined.

United States, hull 9, battle cruiser USN; 850 LBP; 105-4 beam; 30-11½ loaded draft; 33½ loaded speed; 43,500 disp; electric drive, 180,000 SHP; 16 WT boilers; keel Sept25/20; launch and deliver dates not determined.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY, NEWPORT NEWS

Purchasing Agent: James Plummer, 233 Broadway, New York City.

West Virginia, hull 211, battleship USN; 600 LBP; 37-3½ beam; 30-6 mean draft; 32,600 normal disp; 11 speed; GE turbo-elec drive, 28,900 SHP; 8 B&W WT boilers, oil, 41,768 sq ft plus 4168 superheat; keel Apr 12/20; launch Nov/21, est; deliver Dec/22, est.

Constellation, hull 215, battle-cruiser USN; 850 LBP; 101-8½ beam; 31 mean draft; 43,500 normal disp; 33¼ speed, est; Westinghouse turbo-elec drive, 180,000 SHP; 16 WT boilers, oil, 198,000 sq ft plus 18,000 superheat; keel Aug18/20; launch and deliver dates not est.

Ranger, hull 215, battle-cruiser USN; sister to above; keel June23/21; launch and deliver dates not est.

Iowa, hull 258, battleship USN; 660 LBP; 105 beam; 33 mean draft; 43,200 normal disp; 23 speed; GE turbo-elec drive, 60,000 SHP; 12 White-Forster WT boilers, oil, 82,800 sq ft plus 8940 superheat; keel May17/20; launch and deliver dates not est.

John D. Archbold, hull 261, tanker Standard Oil NJ; 555 LBP; 75 beam; 30 loaded draft; 10½ loaded speed; 20,300 DWT; twin screw, TE eng, 3800 IHP; 3 Scotch boilers, 17x12; keel Dec15/20; launch Aug20/21; deliver Oct/21, est.

Wm. Rockefeller, hull 262, tanker Standard Oil NJ; sister to above; keel Dec15/20; launch Oct/21, est; deliver Dec/21, est.

NEW YORK SHIPBUILDING CORPORATION, CAMDEN, N. J.

Purchasing Agent: L. G. Buckwalter.

Southern Cross, hull 241, combination USSB; 534 LBP; 72 beam; 30-6 loaded draft; 18 loaded speed; 11,000 DWT; geared turbs, 12,000 SHP; 8 WT boilers; keel Aug/18; launch July20/19; deliver fall/21, est.

Bay State, hull 251, combination USSB; 534 LBP; 72 beam; 30-6 loaded draft; 18 loaded speed; 11,000 DWT; geared turbs, 12,000 SHP; 8 WT boilers; keel Oct15/19; launch July17/20; deliver winter/21, est.

Peninsula State, hull 252, combination USSB; sister to above; keel July20/20; launch July6/21; deliver spring/22, est.

Lone Star State, hull 255, combination USSB; sister to above; keel May13/19; launch Oct23/20; deliver fall/21, est.

Hoosier State, hull 256, combination USSB; sister to above; keel May20/19; launch Oct23/20; deliver fall/21, est.

Yankee Arrow, hull 260, bulk oil Standard Trans Co of NY; 468 LBP; 62-6 beam; 27-0 $\frac{1}{2}$ loaded draft; 10 $\frac{1}{2}$ loaded speed; 12,550 DWT; 4 cyl QE engs, 3200 SHP; 3 SE Scotch boilers, 15-2x11-6; keel Aug17/20; launch April20/21; deliver Aug2/21.

Empire Arrow, hull 261, bulk oil Standard Trans of NY; sister to above; keel Sept14/20; launch May24/21; deliver summer/21.

Levant Arrow, hull 262, bulk oil Standard Trans Co of NY; sister to above; keel Nov4/20; launch July25/21; deliver fall/21, est.

No name, hull 263, combination Munson SS Co; 414 LBP; 57-6 beam; 23 loaded draft; 15 $\frac{1}{2}$ loaded speed; 4950 DWT; geared turbs, 5800 SHP; 5 SE Scotch boilers, 16-4x12-3; keel Sept30/20; launch fall/21, est; deliver winter/21, est.

Eurana, hull 264, bulk oil stock; 419-3 LBP; 56-3 beam; 25-9 $\frac{1}{2}$ loaded draft; 10 $\frac{1}{2}$ loaded speed; 9870 DWT; 3 cyl TE engs, 3000 SHP; 3 SE Scotch boilers, 15-10x11-4; keel Jan17/21; launch July16/21; deliver winter/21.

No name, hull 265, bulk oil stock; sister to above.

Dixie Arrow, hull 266, bulk oil Standard Trans Co of NY; 468 LBP; 62-6 beam; 27-0 $\frac{1}{2}$ loaded draft; 10 $\frac{1}{2}$ loaded speed; 12,550 DWT; 4 cyl QE engs, 3200 SHP; 3 SE Scotch boilers, 15-3 x 11-6; keel Aug11/20; launch fall/21, est; deliver winter/21, est.

Saratoga, hull 199, battle cruiser USN; 874 LOA; 850 LBP; 105-5 $\frac{1}{2}$ extreme beam; 31 mean draft; 43-50 normal disp; 33 $\frac{1}{2}$ loaded speed; GE turbo-electric drive; 180,000 SHP; 16 WT boilers, 198,000 sq ft plus 18,000 superheat; keel Sept25/20.

Colorado, hull 200, battleship USN; 624 LOA; 600 LBP; 97-3 $\frac{1}{2}$ beam waterline; 30-6 mean draft; 32,600 normal disp; 21 loaded speed; Westinghouse turbo-electric drive, 28,900

SHP; 8 B&W WT boilers, 41,678 sq ft plus 4169 superheat; keel Mar29/19; launch Mar22/21.

Washington, hull 201, battleship USN, sister to above; keel June30/19; launch Sept1/21.

Kamoi, hull 267, fuel ship Japanese Navy; 497-8 LOA; 67 beam; 28 designed draft; 15 loaded speed; 13,000 DWT; elec drive, 8000 SHP; 4 B&W boilers; keel Sept14/21.

STANDARD SHIPBLDG. CORPN., SHOOTERS ISLAND, MARINERS HARBOR, N. Y.

Purchasing Agent: Jamie Cortada. John Purroy Mitchell, hull 32, fireboat City of New York; 121 LBP; 27 beam; 14-9 deep; 12 loaded speed; comp eng, 900 IHP; 2 B&W WT boilers, oil burning; keel Mar31/21; launch Aug6/21.

STATEN ISLAND SHIPBUILDING COMPANY, STATEN ISLAND, NEW YORK

Purchasing Agent: R. C. Miller. Dixiano, hull 726, sugar ship Am Sug Ref Co; 360 LBP; 50 beam; 23 loaded draft; 10 loaded speed; 6300 DWT; TE eng, 2000 IHP; 2 Scotch boilers, 15x11; keel Sept9/20; launch May21/21.

Hell Gate, hull 728, dredge C. R. Browning; 140 LBP; 48 beam; 15 loaded draft; keel Aug28/20; launch Feb23/21.

Socony 114, hull 734, barge Stand Oil of NY; sister to above; keel Jan 10/21.

Socony 115, hull 735, barge Stand Oil of NY; sister to above; keel Feb 26/21.

Hull 736, tugboat Staples Trans Co; 136 $\frac{1}{2}$ LBP; 27 beam; 16 $\frac{1}{2}$ loaded draft; 10 loaded speed; 1 TE eng 700 HP; 1 Scotch boiler, 16x11 $\frac{1}{2}$; keel May16/21; launch July30/21, est.

President Roosevelt, hull 737, ferryboat City of New York; 247 LBP; 66 beam; 19 $\frac{1}{2}$ loaded draft; 15 loaded speed; 1 F&A comp eng, 3500 HP; 4 B&W WT boilers, 13,000 sq ft; keel May23/21; launch July16/21.

Northwestern, tanker Am Pet Co; 242 LBP; 42 beam; 23 loaded draft; 10 loaded speed; TE eng; 2 Scotch boilers; lengthening job, additional 56 ft, making 2 new cargo tanks, 1000 DWT additional capacity. Vessel considered total loss by fire; raised; and now undergoing general repairs and at the same time lengthening. Job started May31/21; estimated time 4 months.

SUN SHIPBUILDING COMPANY, CHESTER, PENN.

Purchasing Agent: H. W. Scott. J. N. Pew, hull 39, tanker Sun Oil Co; 480 LBP; 65-9 beam; 26-7 loaded draft; 10 $\frac{1}{2}$ loaded speed; 12,800 DWT; single screw QE engs, 4300 IHP; 3 SE Scotch boilers, 15-10x 11-11 $\frac{1}{2}$; keel Nov5/20; launch Apr 23/21; deliver Sept/21, est.

Agwiharve, hull 40, tanker A. G. W. I. S. Co; 480 LBP; 65-9 beam; 26-7 loaded draft; 12 loaded speed; 12,500 DWT; single screw QE engs, 4300 IHP; 4 SE Scotch boilers, 15-10x 11-11 $\frac{1}{2}$; keel Nov26/20; launch Apr 2/21; deliver Sept/21, est.

Agwimex, hull 41, tanker A. G. W. I. S. Co; sister to above; keel Dec8/20; launch Aug6/21; deliver Sept/21, est.

Agwiscot, hull 42, tanker A. G. W. I. S. Co; sister to above; keel Dec23/20.

Agwistates, hull 43, tanker A. G. W. I. S. Co; sister to above; keel Jan3/21.

No name, hull 46, tanker Sun Oil Co; 480 LBP; 65-9 beam; 26-7 loaded draft; 10 $\frac{1}{2}$ loaded speed; 12,800 DWT; single screw QE engs, 4300 IHP; 3 SE Scotch boilers, 15x11-11 $\frac{1}{2}$; keel not laid.

No name, hull 47, tanker Sun Oil Co; sister to above; keel not laid.

TEXAS STEAMSHIP COMPANY, BATH, MAINE

Purchasing Agent: A. R. Weber. No name, hull 32, tanker Texas SS Co; 415-10 LBP; 56 beam; 25-7 $\frac{1}{2}$ loaded draft; 11 $\frac{1}{2}$ loaded speed; 9600 DWT; TE engs, 3000 IHP; 3 Scotch boilers, 15-3x11; keel Nov 9/20.

Canadian CANADIAN VICKERS, LTD., MONTREAL

Topdalsfjord, hull 82, single-screw steel 2-deck cargo Norwegian-American Line; 365 LBP; 49 $\frac{1}{2}$ beam; 29 loaded draft; 11 $\frac{1}{2}$ loaded speed; 6400 DWT; TE engs, 2600 IHP; 3 Scotch boilers, 14-9 with superheaters; keel July29/20; launch May5/21; deliver July22/21.

DAVIE SHIPBUILDING & REPAIRING COMPANY, LTD., LAUNSON LEVIA, P. Q., CANADA

Purchasing Agent: N. W. Van Wyck.

Canadian Challenger, hull 476, single-screw cargo Canadian government; 400 LBP; 52 beam; 25-3 loaded draft; 11 $\frac{1}{2}$ loaded speed; 8350 DWT; TE surface cond engs, 3000 I HP; 3 Scotch marine boilers, 15-6x 11-6; keel May14/20; launch July 7/21.

NOVA SCOTIA STEEL & COAL CO., TRENTON, N. S.

Purchasing Agent: A. M. Seely. Sea King, hull 9, exploring yacht Baron Blais, Nassau, Bahamas; 137-10 LBP; 28-6 beam; 6 loaded draft; 7 loaded speed; semi-Diesel 440 HP, twin-screw eng; keel Aug24/20.

Eighty per cent of the Shipping Board's fleet is oil-burning, according to a recent tabulation; 41 per cent burns nothing else, and 31 per cent burns either coal or oil, leaving 28 per cent strictly coal. Figures include vessels still building.

What Repair Yards Are Doing

Repair Work Offers

Some repair and alteration jobs are in prospect. The Matson Navigation Company will withdraw the steamship Lurline from the San Francisco - Seattle - Honolulu service for extensive changes, among which will be the construction of a promenade deck, the enlarging of passenger accommodations and general overhauling. The work will cost between \$200,000 and \$250,000, it is estimated. The Inter-Island flagship Mauna Kea, Honolulu, will be dispatched to the Pacific Coast for repairs, the exact nature of which will not be known until she arrives about October 15. Her engines will be removed to permit examination of the bed-plate and of the tank-top.

Several small vessels are to be rebuilt for the Buxton Line for their service from Richmond to Norfolk and plans for this work are under consideration by marine engineers of Philadelphia. Two small passenger and freight vessels for coast and bay service to be inaugurated in 1922 will be built by Chapman & Fisher at their shipyard on the Great Lakes.

Todd Gets Large Job

The Tietjen & Lang repair yard, Todd Shipyards Corporation, Hoboken, has been awarded a contract for reconditioning the San Jacinto, recently chartered by the Ward Line from the Clyde, which will cost more than \$1,000,000 and includes the installation of four new Scotch boilers, new reciprocating engines, renewal of the present stateroom capacity, the installation of oil fuel tanks, and the possibility of one additional deck. The same yard has also been awarded the contract for removing the main engines, rebuilding newly designed engine foundations, reinstalling the engines and the carrying out of considerable repair work on the old and the installation of new auxiliary machinery in the Mallory Line ship Henry R. Mallory. The bid for this work was \$45,740.

The Standard Shipbuilding Corporation has been awarded the contract for cutting down two car floats of George B. Stearin, Inc., New York, making them into four scows. The car floats are about 390 feet long and will be made into four scows, each 150 feet long.

The Todd Drydocks, Seattle, have been awarded a contract for rebuilding the steamship Whatcom of the Puget Sound Navigation Company into a double-ended ferry having ac-

commodations for 1500 persons and sixty automobiles. The work will cost about \$100,000.

With the Drydocks

The Panama Canal has announced reductions in rates of the 1000-foot drydock at Balboa, effective August 15. On gross tonnage of merchant steamers and Army and Navy transports, colliers, hospital and supply ships, on the net tonnage of merchant sailers, on actual displacement tonnage of warships, the old charges were 25 cents a ton for docking and undocking, one charge covering both operations, and 15 cents for each lay-day. These have been reduced to 15 cents and 12 cents. Says the canal's announcement: "The establishment of the new rates indicates a change of policy, in basing the charges at the Balboa drydock on customary rates in commercial drydocks on the Atlantic, rather than on rates at Pacific docks, as heretofore."

A marine railway under construction at the yard of the Hanlon Drydock & Shipbuilding Company will be completed and ready to receive vessels about October 1.

Reports from Japan say that the Yokohama Dock Company, which has been an important building and repair yard of Tokyo Bay, will close. One vessel for the Japanese Navy remained to be completed at mid-August.

New Ventures

Rumors are current that the Chickasaw Shipbuilding & Car Company will construct wharves for handling the United States Steel Corporation's exports from the Birmingham district, and that the yard also will construct river barges. The last steel steamship building is scheduled to be completed in October.

One of the oldest shipyards in Ontario, the Port Arthur Shipbuilding Company, recently completed the last contract and is now reported to be doing repair work in their shipyard and drydock. However, the company has embarked very strongly on the manufacture of pulp and paper machinery, and by this means will be able to keep the plant running profitably till better days come. In the meantime, repair work will be carried on as usual.

The H. W. Sweet Shipyard & Machine Works, Inc., Greenport, New York, incorporated recently with a capital of \$75,000 by H. W. Sweet, F. B. Corey and C. W. Thorn. The Company will operate a shipbuilding plant and general machine con-

struction and repair works.

The Hampton Roads Ship Repair Corporation, Norfolk, has been incorporated with a capital of \$50,000 to operate a local shipbuilding and repair plant. William H. Johnson is president and E. C. Davison, Richmond, secretary.

Drydocking and Repairs

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Potrero Works

Miscellaneous repairs: Pleiades, Rose City, Ventura, Bradford, Frederick Luckenbach, Silvanus, Chancellor, Venetia, Admiral Goodrich, Harry Luckenbach, K. I. Luckenbach, Tjikembang, Oleum (also renewing H. P. cylinder). Miscellaneous repairs, drydocking, painting: Katrina Luckenbach (also installing bilge keel), Willamette, Wakhenna, Johan Poulson, Storm King, Montebello, Walkure (also electric welding on hull), Coquille River, Apus, Narbo. Installing 3rd class accommodations: Golden State. Drydocking, cleaning, removing and replacing fairwaters, incline ship: California. Repairing submarine signals: Wm. F. Herrin, New wildcat for windlass: Yorba Linda. Engine, boiler, hull repairs, drydocking, painting: West Mahwah, Cuba. Remetalizing engine bearings: Matsonia. Repairing damaged propeller: D. G. Scofield. Drydocking, painting: Oleum. Renewing T. & G. decking: Coalings.

Alameda Works

Reinforcing deck in way of fairleads: W. S. Miller. Miscellaneous repairs, drydocking, painting: Governor Irwin (also new propeller, rewooding stern bearing), Halco, Sophie Christensen, Petaluma. New propeller: Rosalie Mahoney, Vanguard. Miscellaneous repairs: Bragford, Caddo, Tivontolite, S. C. T. Dodd, Tiverton, Davenport. Repairing circulating pump: Johan Paulson.

LOS ANGELES SHIPBUILDING & DRY DOCK COMPANY, SAN PEDRO

Drydocking, painting, miscellaneous repairs: Invader, Henrietta and Springfield. Miscellaneous repairs: Anyox, West Lewark, Steel Mariner, Multnomah, Silvanus, Providencia, Artigas, West Haven, Santiam, Trojan, Oregon. Drydocking, painting, renewing part of keel, propeller arch knee and bilge keels: Bertie M. Hanlon. Drydocking, cleaning, painting: Harvard. Boiler repairs: K. I. Luckenbach, Venetia, Santa Alicia, Edward Luckenbach. Engine and auxiliary repairs: Sierra, West Greylock, Lompoc (also hull and machinery repairs), Mullany No. 325 (also changing propeller), L-7, barge No. 30 (also changing propeller), Nicholas No. 311, Argyll (also hull and machinery repairs). High speed planet pins for turbo gears: Eagle Boat No. 11. Minor hull repairs: Invader.

MOORE SHIPBUILDING COMPANY, OAKLAND

Drydocking, cleaning, painting and miscellaneous repairs: Eastern Merchant, West Cussetta, West Camak, Los Vegas. Engine room repairs: Maul. Hull repairs: Georgina Rolph (also wheel work), Tjisonardi, Golden Gate, Claremont, Pedro Costa. Engine repairs: Venezuela, Wm. F. Herrin, Miner, Santa Rita, Ventura. Deck repairs: Janelaw. Drydocking, cleaning, painting, miscellaneous hull repairs: Ripley, Samar, Virgil Bogue, Wahkena, Kahola, Los Angeles. Engine and hull repairs: Creole State. Drydocking, cleaning, painting: Tampa. Miscellaneous repairs: Manukai, Western Pacific Barge No. 2, Celestial (also installation of oil-burning system). New stern frame: West Nomentum. Winch parts: Narcissus. Burner parts: Santa Monica.

NAVY YARD, PUGET SOUND

Drydocking, cleaning, painting bottom, miscellaneous repairs and alterations: Battleships New Mexico, Idaho, Mississippi; Destroyer Sinclair; Minesweeper Swallow; Rec. Ship Philadelphia; Patrol Vessel Helori; Tug Mahopac; SS. West Ivan. Drydocking, cleaning bottom, miscellaneous repairs: Coal Barges 156, 159, 171, 190, 361, 373, 390, 395, 445; Garbage Lighter 7; Pile Driver 2. Minor repairs to main engines: Amm. Ship Pyro. Miscellaneous alterations and repairs: Battleship Texas; Radio Rep. Ship Saturn; Destroyers Moody, McCawley, Doyen, Henshaw, Meyer. Miscellaneous repairs incident to operation as district craft: Patrol Boat Eagle 57; Tugs Pawtucket, Sotoyomo, Tatnuck, Iroquois. Care and preservation: Battleship Oregon; Armored Cruisers Seattle, Missoula, Charlotte; Patrol Boat S. C. 310.

SOUTHWESTERN SHIPBUILDING CO., EAST SAN PEDRO

Winches: Julia Luckenbach. Renewing wildcat on windlass, painting: Yorba Linda. Main steam pipes: La Habra. Boiler repairs: Harry Luckenbach.

TODD DRY DOCKS, INC., SEATTLE

Docking, cleaning, painting, miscellaneous repairs: Washington Barge No. 57. Renewing shoe: Warrior. Miscellaneous repairs: Eldridge (also new stern frame), Sol Duc, H. B. Lovejoy, Tyndareus. Extensive repairs and betterments: Wenatchee, Keystone State. Docking, cleaning, painting: Admiral Dewey, Victoria, Queen, Ketchikan, President, Barge Hercules, Forest Dream. Change of wheel: Westerly, Aquilo. Galley repairs: Forest King. Docked for survey: Redondo. Caulking leaky rivets: Steel Mariner. Engine repairs: Bailey Gatzert. New stern frame: West Ivan.

YARROWS, LIMITED, VICTORIA, B. C.

Docking, cleaning, painting, mis-

cellaneous repairs: Canadian Importer, Princess Maquinna (bottom damage), Canadian Prospector (annual government inspection). Engine repairs: Estevan. Docking, cleaning, painting: Stadacona, Naden. Rudder and propeller repairs: Bonilla. Feed heater and condenser repairs: Keystone State. Electric welding: Tyee. Complete overhauling: Caddo.

Miscellaneous Construction

COLUMBIA STEEL COMPANY, PITTSBURGH, CALIF.

Steel castings for many steel vessels now under construction in the Pacific Coast yards, including the dreadnought Montana and the sister ships 49, 50, 52; also for Coast Guard cutters under construction in the Union Coast Co. yard.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO., PHILADELPHIA

Twelve Parsons manganese bronze propellers for scout cruisers 4, 5 and 6 building by Todd Drydock & Const. Corp., Tacoma. Two right-hand and two left-hand propellers for each vessel. Weight of propellers 13,200 pounds each; diameter 11-3; pitch 11-10; all delivered.

ALLAN CUNNINGHAM COMPANY, SEATTLE

On order and under construction: 6 steam and electric steering gears; 13 steam and electric anchor windlasses; 18 steam and electric and hydro-electric and hand capstans; 37 steam and electric winches.

M. T. DAVIDSON COMPANY, 154 NASSAU STREET, NEW YORK CITY

Vertical beam, twin-cylinder air-pump, 9-18x12 and two vertical duplex boiler feed pumps 9-16x10 for New York City fireboat John Purroy Mitchell.

Vertical, twin-screw air-pump, 14-24x15, two vertical simplex boiler feed pumps 10-6x12, one horizontal simplex sanitary pump 5 1/2x8 for Philadelphia fireboat Rudolph Blankenburg.

Similar equipment for second Philadelphia fireboat.

DOW PUMP & DIESEL ENGINE COMPANY, ALAMEDA

H. T. Harper, motorship Standard Oil Co., one 200 IHP, two 267 IHP Diesel auxiliary electric drive engs.

JAMES C. H. FERGUSON, SALES AGENT, MONADNOCK BLDG., SAN FRANCISCO

American Engineering Co.: Four steering engines, ferries Newark and Piedmont; electric capstans drydock Moore; hydraulic telemotor, hull 2077, Moore; 3 towing machines, 4 steering engines, Shipowners & Merchants' Tugboat Co.

Pneumercator Co.: 116 pneumercators USS California, Mare Island; 40 for 4 Coast Guard cutters, Union

Construction; 8 for West Faralon; West Greylock, West Prospect, West Chopaka, Los Angeles; 60 for 12 submarines USN, Bethlehem.

Rostand Mfg. Co.: air ports and lenses complete 5 Coast Guard cutters and 4 Anglo-Saxon tankers, Union Construction Co. Rich system for detecting and extinguishing fires: SS Hawkeye State, Granite State, Empire State, Golden State, Buckeye State.

FORD & GEIRRIE, AGENTS, SAN FRANCISCO

Dean feed pumps, Dean Bros' Steam Pump Works, for 166 at Moore's; Reliance forced draft equipment, Jno Reid & Company, for hull 166 at Moore's; National stockless anchors Upon Walton Co., hull 166, Moore's; Dean feed pumps, Dean Bros' Steam Pump Works, hull 23, Southwestern; Willett Bruce whistle control, McNab Co., hulls 16, 17, 18, 19, Union Construction; McNab direction indicators, McNab Co., hulls 16, 17, 18, 19, Union Construction; Reliance forced draft equipment, John Reid & Co., hull 23, Southwestern; Anchor chain, Lebanon Chain Co., hull 23, Southwestern; windlass, gypsy and steering gear, Hyde Windlass Co., hull 20, Union Construction; Welin davits, American Balsa Co., hulls 5311-2-3, Bethlehem, hull 163, Moore; Willett-Bruce whistle control, McNab Co., hulls 5311-2-3, Bethlehem; McNab direction indicator, hulls 31-2-3-4-5, Los Angeles; Balsa wood for cold storage, American Balsa Co., hulls 5311-2-3, Bethlehem; Mills releasing gear, hulls 24-5-6, Southwestern; balsa wood cold storage, American Balsa Co., hull 23, Southwestern.

LIDGERWOOD MFG. COMPANY, NEW YORK, SAN FRANCISCO, LOS ANGELES

One 10x10 inch screw gear steering engine for USS Holland building at Puget Sound Navy Yard.

Two No. 1917 standardized ship's winches, Alaska S S Co., Seattle.

PACIFIC DIESEL ENGINE COMPANY, OAKLAND (Formerly Skandia Pacific Oil Engine Company)

Purchasing Agent: A. Bolander. Ten 850 BHP Werkspoor Diesel engs building for USSB; 6 cyl, 135 RPM; 8 delivered.

One 150 BHP Werkspoor Diesel marine engine.

One 100 BHP Skandia marine eng. Several small Skandia engs from 9 to 36 BHP.

One 140 BHP Skandia marine engine.

STEWART DAVIT & EQUIPMENT CORP., NEW YORK, SAN FRANCISCO, SEATTLE

Steward davits are being installed in the following: At Union Coast Co: Coast Guard cutters, hulls 16, 17, 18, 19; Canadian Pacific lines, Wallace yard, Vancouver.



A Reply to Mr. Shoup

You speak of the use of steel being handicapped in California because of freight rates and that California fruit cannot be moved in the opposite direction for the same reason.

Steel moves from the Atlantic seacoast to the Pacific very largely by water. Canned goods and dried fruits, to a considerable extent, move in the opposite direction in the same way, yet the business of this country moved by salt-water routes is at rates so low that the Shipping Board is operating the government ships at a loss of a million dollars a day.

Surely with a third of the ships of the world tied up there is something besides railroad transportation interfering with business.

—From "Are Railroads Passing?" by Paul Shoup, vice-president of the Southern Pacific Company.

In this manner the vice-president of one of America's great railroad systems dismisses the recent unparalleled development of intercoastal steamship traffic and the present commanding position of the steamship in United States domestic trade; dismisses both too lightly, it would seem, and in a manner that unfortunately confuses the minds of those who read Mr. Shoup's memorandum in the San Francisco Call. The "man on the street" would assume that intercoastal steamship lines have been able to cut the ground from under the feet of the railroads only because water transportation has been at rates ruinously low, at tariffs that inevitably resulted in Shipping Board deficits, which had to be made good by the taxpayers of the country. Such an assumption would be justified by the paragraphs quoted, despite the fact that Mr. Shoup does not say explicitly that intercoastal traffic is moving at an actual loss; the added inference is drawn, also, that Shipping Board tonnage is engaged largely in the domestic trades using the Panama Canal.

What Is the Truth?

What are the facts? At the first

of September approximately 500,000 deadweight tons of shipping was employed in the intercoastal trade. A more precise statement would be difficult to make because some vessels were employed in domestic transportation in one direction but not in the other. Of this aggregate what portion was owned by the Shipping Board? There were two 535's, the Hawkeye State and Buckeye State, both operated by the Matson Navigation Company, although one had been diverted temporarily to the trans-Pacific trade; there were also four freighters of 33,835 deadweight tons operated by the North Atlantic & Western. Some other vessels might appear sporadically, but the six listed were all that were regularly engaged. Five hundred thousand tons of shipping, Mr. Shoup, of which one-tenth was owned by the Shipping Board: how do these figures square with your statement that "the business of this country moved by salt-water routes is at rates so low that the Shipping Board is operating the government ships at a loss of a million dollars a day"? What about the 450,000 tons of privately-owned shipping? Are the owners of that tonnage also losing money?

Best in the World

Perhaps they are; but, if so, hundreds of shipowners in the world would wish to lose money in identically the same manner. No one even slightly in touch with shipping would deny that the American coastwise trade is the best to be found on any ocean today, that it began, or rather resumed, when the present business depression was in its infancy, and that the tonnage employed continued to increase during all of 1920, even though it is true that there is a superfluity of vessels in the business today. What the volume of traffic is may be seen by statistics of the Panama Canal for July, 1921, during which 19 vessels carrying 60,997 long tons of cargo in the coastwise trade passed from the Atlantic to the Pacific, and 15 vessels with 92,659 long tons passed in the opposite direction. The aggregate, Mr. Shoup, is 172,094 short tons of 2000 pounds, or sufficient to fill 4300 railway cars

of 80,000 pounds' capacity each. Some of this traffic, perhaps a large portion, does move by rail to and from tidewater, and so is productive of railroad revenue; but the railroad receipts on a ton of steel moving from Pittsburgh to Baltimore are little enough compared with what would be had for transporting that same steel overland to Seattle.

Lost to the Railroads

By and large, this enormous intercoastal business is not something that has been developed by the steamships. It is normal domestic trade, diverted from the railroads to water because of lower rates offered by the steamships and also in part because of quicker delivery; it is business, with very few exceptions, perhaps none, that the railroads might have had but probably can never hope to get again. Barring blocking of the canal, intercoastal shipping will continue, doubtless will grow greatly, all at the expense of the railroads, which, so far as the mass of tonnage moving between the Atlantic and the Pacific coasts is concerned, are definitely eliminated from the long haul. They will handle perishable goods, they will run special silk trains; they will not, in the absence of the miraculous, restore their old transcontinental business.

Mr. Mann's Argument

When the intercoastal lines resumed operations early in 1920 they lacked precedents for many tariffs; consequently they took over those of the railroads, made sufficient reductions to attract business, and set to work. Here and there, since that beginning, rates have been made without regard to those of the railroads, especially in the event that unusually low tariffs had to be made in order to permit such commodities as dried fruits to seek a market on the Atlantic; in spite of that, intercoastal rates continue to bear a close relation to those of the railroads. Voices begin to be heard, however, demanding that water tariffs be based on costs of operation and not on those of the rail lines; Seth Mann, traffic manager of the San Francisco Chamber of Commerce, has

been especially zealous in urging the doctrine, and it is probably true that the great question to be threshed out by the shipper, the steamship and the railroad is just this. But a writer named Riccardo enunciated the theory that the price of any commodity must be the necessary price of any considerable portion; that the cost of raising the last thousand bushels of wheat determines the price received for all the remainder, regardless of how cheaply produced. This holds good for transportation considered as a commodity. In other words, so long as the railroads continue to be factors in transcontinental business, whether by offering special inducements, by making low rates for attractive freight, by improving their services, by taking advantage of the errors of intercoastal lines, or by moving freight from interior cities in competition with that originating near the seaboard, just so long will steamship rates bear some relation, probably close, to those of the overland lines. But if Mr. Mann's argument should prevail, or if the intercoastal companies voluntarily should choose to ignore railroad rates, as they did a few months ago in reducing the dried-fruit tariff, then the railroads would find themselves utterly unable to compete with water transport systems for even the transcontinental business that they have now. The irreducible minimum of the railroad would be fat for the steamships. Even today, in these times of business stagnation, many of them are making exceedingly handsome profits, and not at the expense of the American taxpayer. Of how many railroads, Mr. Shoup, can that be said?

Refrigerator Outlook Unpromising

In the discussion of Mr. Shoup's analysis of the railroad-steamship situation, the statement was made that the overland lines would continue to move perishable goods. To what extent will that be true of the principal perishable product of the Pacific Coast—that is, fresh fruit? A large and growing number of steamship operators would reply that they are quite willing to concede to the railroads practically all of that business; and this despite the great deal of discussion of the last year regarding refrigerator services to the Atlantic, and more recently of extensive services to Europe. The attitude of some shipping men was outlined in these pages a few months ago, the argument being advanced that the large tonnages required for

a solid refrigerator vessel, the consequently great amount of fruit suddenly cast on a limited market of the Atlantic, without opportunity being offered to divert shipments to the great territory stretching from Kansas City to Buffalo, and the lack of adequate storage facilities in New York and the difficulty and expense of reshipment to the interior would militate against any effective use of refrigerator vessels in the intercoastal trade. That this argument is not without merit is proved by the marked hesitancy of steamship lines to build refrigerator vessels.

The European Situation

Almost identically the same chain of reasoning was advanced recently by a Pacific Coast shipping man, who, it should be said, is connected with a great trans-Atlantic company that has no direct Pacific affiliations. In discussing the reported plans of Furness-Withy to place refrigerator vessels in the Pacific-European trade, he said that Western fruit exporters could not be expected to ship large quantities by one steamer. In the past they have refused generally to forward on through bills of lading, because they wished to be able to sell in the Eastern markets of the United States, if conditions were favorable; and in any case, to store fruit on this side of the Atlantic if that should be necessary in order to avoid a glut in Europe. If markets should be exceptionally favorable, he continued, they might ship solid cargoes from Halifax or Boston; in that event, however, they had made sure of their ground beforehand and were in a position to strike quickly; whereas fruit once committed to the long Pacific-Panama-Europe route was beyond hope of diversion.

Lack of Storage in U. K.

There is, however, a pronounced lack of refrigerator storage in the United Kingdom, so that whole cargoes of fruit cast on British markets would have to be disposed of, almost regardless of price. To buttress his arguments, the shipping man quoted said that an important exporter had decided to reduce the volume of his all-water shipments for 1922 considerably, despite a prior promise to dispatch several thousand boxes.

There doubtless is much to be said in reply to this brief. Adequate storage houses in Europe and a market sufficiently enlarged and stabilized to relieve the exporter of all dependence upon the United States might solve all difficulties. But it is to be doubted whether either condition is to be expected soon.

A One-Act Playlet

Civic Pride vs. A Demand for Economy might be made the title of a Little Theater play based on the recent to-do at Portland, Oregon. In compliance with what might be described as a mandate of the people of the United States, the Shipping Board decided to reduce its trans-Pacific services in order to make them conform more nearly to the requirements of trade. Believing that the Portland berth, among others, had too much tonnage, the board wished to eliminate one company. Either the Columbia-Pacific or the Pacific Steamship had to go.

But the board's decision was misunderstood by Portland, or else the city wished to retain both lines despite the demand of the people and Congress for retrenchment. Accordingly a protest against withdrawal of the Pacific Steamship Company's vessels was made. "Very well," the Shipping Board replied in substance, stroking its collective chin, "we shall take the Columbia-Pacific steamers." This it was about to do when Portland awakened to a realization of the essentially false position in which it had been placed; Commissioner Chamberlain, who in this case was spokesman for the city, fought the issue to a finish and won, with the result that the board, according to advices from Washington, decided to permit the Columbia-Pacific to retain its Portland-Oriental vessels and to make the Pacific Steamship the sole operator from Seattle, Waterhouse and Struthers & Dixon being dropped. Portland is pleased, because the Columbia-Pacific is a home company, while the Pacific Steamship is not; Portland most certainly should be pleased at having escaped the consequences of a half-cocked action. There was, of course, a struggle between the two companies, as there properly should have been, for no one would expect either to give up without an effort. No, the steamship lines are not to blame. But the Portland Chamber of Commerce is. Other seaboard cities might take the lesson to heart and decide here and now to acquiesce gracefully in the retrenchment program of the Shipping Board. Gentlemen who protest against the burdens of taxation and then work, wittingly or unwittingly, against a policy designed to save money, are exceedingly likely to be misunderstood.

Lumber and the Inevitable

In the movement of lumber from the Pacific Coast to the Far East the inevitable has occurred. Those

shippers who expected the absurd rate of \$12.50 to rule indefinitely were rudely awakened August 20, when the Shipping Board directed that no more booking be made. As a result, shippers found tariffs raised by \$2.50 in San Francisco and Portland, and in Seattle, although rates had not been advanced beyond \$12.50 on September 15, exporters were offering advances of \$1, \$1.50 and \$2 over tariffs. The moral is this: unremunerative rates are not good for the steamship operator, and the shipper does not profit in the long run.

65,000,000 Feet to Be Shipped

But heavy cargoes will continue to move for months. At the first of September there probably was an aggregate of 65,000,000 feet awaiting shipment from the Columbia River and Puget Sound. To move this immense amount would require all available tonnage until January 1. So heavily were American steamers engaged that they found themselves unable to participate in the unexpected offerings of general merchandise, which necessarily went in large part to the foreign lines. Whether by accident or shrewd calculation, the Japanese and British decidedly got the Americans on the hip, for our friends the enemy did not go mad about lumber at \$12.50.

Signs have been numerous for months that the Shipping Board was determined to reduce expenses and that the present operating system, under which the agent receives a percentage of the gross freight, probably would be superseded by a bareboat charter form. In such circumstances it would appear to be exceedingly unwise to make rates so low as this, which by the sheer volume of business produced might be profitable to the operator but which was no more than sufficient to pay the board expenses even if all went well. Nevertheless, American lines were stampeded into an indiscriminate booking of lumber by the millions of feet until the board issued its general order suspending further acceptance.

An Indirect Increase

In another direction the market moved against lumber exporters. They had persuaded steamship lines to accept logs on the Brereton scale, which means that logs moved at board measure, bark included despite the fact that the cylindrical form of a log results in waste space. Although the California Westbound Conference never acquiesced formally in this plan, the members were putting it into effect quite openly for a month or so until the confer-

ence put down its foot September 13. Thereafter the square of the mean diameter applied; or, in other words, the log was regarded as equivalent to a cube having the mean diameter as a side. Such it is to a steamship company selling space. The increase in measured content, and consequently in revenue, was 27.3 per cent. On top of all this, shippers began to offer a premium of \$2 a thousand feet on logs moving from San Francisco.

On February 14 the old Pacific Westbound Conference reduced the lumber rate from \$12.50 to \$10 after a Shipping Board line had received permission to book cargo at Vancouver at \$12.50, presumably American currency, but in reality Canadian. To help on the slash the Blue Funnel was said to have made a cut to \$10, to which the Pacific Steamship retaliated by booking millions of feet at the same figure. Plans were laid a few weeks later to increase the rate to \$15, but companies that were not booked heavily at \$10 demanded that they have an opportunity to get business at the low tariff. Next came an announcement that the rate would go to \$15 July 1, from which resulted a scramble to place business, and the Shipping Board thereby gained an opportunity to decline to accept more \$10 lumber but to offer to take business at \$12.50. The \$15 rate did not become effective July 1, however. Finally the board tired of the whole affair and turned down all lumber offering.

The Flowers of Yedo

Lumber exporters apparently realized that they had been enjoying too low a rate and proposed to advance their prices to Japanese consumers, who probably would pay the extra freight. They probably will, for Japan is using enormous quantities of lumber; winter is approaching, moreover, and the "flowers of Yedo," the Japanese euphemism for the destructive fires that sweep Tokyo, will begin to blossom soon.

Eastern Export Rates

No great stir has been aroused on the Pacific Coast by the announced intention of Eastern railroads to make effective export rates, principally on steel, the new tariffs being 25 per cent less than domestic. Except for the interest taken in the application of the export principle to Eastern rail business the Pacific was decidedly apathetic. Pittsburgh steel will move to foreign ports for \$1.90 a ton less, a reduction having been made from \$7.60 to \$5.70; but Pittsburgh steel long ago ceased to move overland, although a

recent booking of 400 tons for Seattle transshipment did cause a mild sensation. If the export rate should be applied to Gary and Chicago, as it presumably will be, no steel could move from those centers in competition with Pittsburgh-Atlantic or even Pittsburgh-Pacific. Chicago-Atlantic steel could be landed in Kobe for \$20.15, as against a new Pittsburgh-Atlantic rate of \$16.40, and a Pittsburgh-Pacific cost of \$19.20.

Effect on Pacific

But the Pittsburgh export rate does play hob with plans to put in a 61½ cent rail rate from Chicago to the Pacific Coast, which, it was anticipated, would result in the flow of some steel from Gary and South Chicago in competition with Pittsburgh. This proposed Chicago-Pacific rate of \$12.30 a short ton, plus the \$5 trans-Pacific rate, would total \$17.30, or \$1.90 less than the present cost. But this is precisely the amount of reduction extended to Pittsburgh, so that no change would be made in the relative positions of Atlantic and Pacific, the latter still being at a disadvantage of 90 cents.

Apparently the new Eastern export rates were inspired by no animus against the Pacific; they probably look to improving the condition of Middle Western exporters in competing with Europe. Such a motive is admirable; but some Chicago steel moving overland would have been a "grand and glorious" sight.

Rail Rates Cut

Certainly the railroads these days are sorely beset. They work with steamship lines in raising export and import rate structures and immediately turn about and fight other water transportation systems, for example, the intercoastal companies. The Southern Pacific has announced reductions of as much as 40 per cent on iron and steel moving from Trunk Line and Central Association territory to the Pacific Coast. The principal reductions will be: from \$1.83½, New York, and \$1.66, Pittsburgh, to \$1 on bars, plates, sheets, structural iron, etc. It is hoped that the Eastern lines will concur in time to make the rates effective October 3.

Great Grain Contracts

Announcements have been made in Portland and Seattle that the Gray-Rosenbaum Grain Company, a consolidation of the J. Rosenbaum Grain Company of Chicago and P. N. Gray & Company of New York, had signed contracts for the movement of at least 5,000,000 bushels of grain through each port a year. These amounts are minima, but Port-

land expects a movement of 50,000,000 bushels during the year 1921-1922.

Grain will be handled at Portland in bulk, the municipal elevator at that port being equipped with fourteen spouts for simultaneous delivery. The 10 per cent differential rate from the Snake River basin, recently granted to Portland; the excellent equipment of the port; the number of steamship lines available, and the mild winter temperatures, all combined to give the city this new business. Over the protests of other shippers, the Portland commission of public docks has reduced charges for shipments in excess of 4,000,000 bushels by one shipper during the current fiscal year. The Gray-Rosenbaum company would receive a rate of 50 cents a ton as against 60 or 75 granted smaller shippers.

Bean-Cake and Politics

In the turmoil of Eastern Asia today there is much that is no more intelligible than the workings of an ant-heap. Semenoff a fugitive after the death of Kolchak; Semenoff reappearing at Vladivostok on board a Japanese vessel; Semenoff forbidden to land; Semenoff landing nevertheless; Semenoff deposed by the Cosacks; Baron Ungern appearing at Urga at the head of a sadly-mixed army; Baron Ungern making a working arrangement with the Living Buddha; much running to and fro in Tokyo and Peking over the ensuing complications in Mongolia; Kappellist coup at Vladivostok; continued Japanese occupation of that city, counterbalanced with vague promises of evacuation; reported destruction of the Far Eastern Republic, mildly denominated as "pink"; wars and rumors of wars: such is the state of that considerable portion of the earth lying west and northwest of the Sea of Japan. A disturbed ant-heap is orderly in comparison.

Freights and Frights

But now and then some keen individual believes that he can detect a slight pulling of strings. One such person is known as Orrin Keith. He has been traveling through the Far Eastern Republic, which with much tribulation succeeded to the reins of authority after Kolchak was last seen tossed aloft on the bayonets of Red troops; in his travels Mr. Keith has discovered a singular connection between freights and frights, between bean-cake and politics. Let him tell the story in his own words:

There is the railroad running through the middle of the country—its alimentary system. Vladivostok

harbor is its mouth, the road from Nikolai to Vladivostok is its throat. Here, with its clutch on mouth and throat, is the Japanese army. Slowly they are strangling the life out of the young republic. If Vladivostok were open and the Japanese clutch removed from the throat at Nikolai, the Usuri Railway, from Vladivostok to Habarovsk, would at once begin to pay expenses.

But Vladivostok is not open and the fingers still press deep at Nikolai. The grip was slackened a few months ago. The Vladivostok government had recognized the Far Eastern Republic. The city was quiet. Trade was beginning again. Capital was gradually recovering from its fright. Taking advantage of this condition, the Chinese Eastern Railroad lowered the rate to Vladivostok from all points west of Harbin so that it could compete with the rate through Dairen over the South Manchuria Railway of Japan. The traffic through Dairen dropped to a fraction of its former amount. That through Vladivostok increased accordingly. From the middle of April to the latter part of May 250 carloads a day were loaded in Manchuria for the Russian ports. Part of the income from this traffic came to the Russian railways for the haul from Pograditchnaya to the sea. At Vladivostok it was distributed to the ships of various nations, not the smallest part going to vessels flying the United States flag.

Such a condition was a great encouragement to Shatov (minister of transport of the Far Eastern Republic—Ed.) and his fellow workers. But it was not satisfactory to the Japanese. They greatly preferred to have this freight go over the Japanese line from Changchun to Dairen and from there in Japanese ships to all parts of the world. The coincidence has already been mentioned. The Kappellist uprising made Vladivostok no longer suitable for the transshipment of goods. The traffic from Manchuria again started southward, safely in Japanese hands.

A Remarkable Interest

This may explain the remarkable interest manifested in Dairen a few months ago by Japanese steamship lines. It was whispered that coal was cheaper in Dairen than in Nagasaki; perhaps it was, but even so, Dairen is a long way from the mouth of the Yangtze and the regular ports of call of trans-Pacific liners.

For what may become the greatest port of the Far East, Dairen is singularly little known in the United States. If it were called Port Arthur some of our ignorance would be dissipated, for Port Arthur was the fortification and Dalny (now Dairen) was the city about which there was a vast deal of fierce fighting in the Russo-Japanese War. In his eternal

search for an ice-free port, the Bear settled himself in Dalny in 1898. He extended the Chinese Eastern Railway and built and planned on a large scale indeed; but the war came in 1904, Dalny was occupied immediately by the Japanese and Port Arthur, some forty miles distant, finally was captured by Japanese armies under command of a general named Nogai, who afterward harakiri-ed in Tokyo on the evening of the funeral of Emperor Meiji.

An Ice-Free Port

Japan succeeded to Russia's so-called "lease" of the Kuantung peninsula. The South Manchuria Railway took over the rail lines; the inner harbor of Dalny, now Dairen, was deepened to 25 feet at low tide; to one pier, 2000 feet long and 350 feet wide, built by the Russians, the Japanese added another, 2000 feet long and 570 feet wide, which had been begun by the Bear; and within a few years added a third, of the same length as the others and 400 feet wide, and like them constructed of solid masonry. Docking facilities for 34 vessels are offered, the entire length of docks being 13,000 feet, and there are some 40 warehouses on the docks, sufficient for the storage of 250,000 tons of goods.

Dairen is the sole ice-free port of Manchuria. Vladivostok, up in Siberia, is blocked much of the year, although the Russians did some remarkable work with ice-breakers during the first part of the war. But the Siberian port is under great natural disadvantages, to which, it appears, are added others designed and nurtured by man.

Where the Trade Has Gone

Trade currents are apparently returning to pre-war conditions. During the war, says the Trade Record issued by the National City Bank of New York, the dangers to navigation on the Atlantic resulted in a considerable increase of movement of certain classes of merchandise across the Pacific. In the year before the war, 55 per cent of the merchandise imported into the United States entered through the port of New York, and 72 per cent of the imports entered through the Atlantic ports as a whole. In the fiscal year 1918, with the dangers to navigation on the Atlantic, the share of the imports entering through New York had fallen to 42 per cent as against 55 per cent in 1914, and that entering through all the entire Atlantic frontage was but 58 per cent as against 72 per cent in 1914. Meantime, import trade entering Pacific ports had increased from 7 per cent in 1914 to 21 per cent in 1918.

With the termination of the war, however, imports entering New York slowly returned to normal, having increased from 42 per cent in 1918 to 53 per cent in 1921, as against 55 per cent in 1914, while the share entering by way of the Atlantic ports as a whole advanced from 58 per cent in 1918 to 69 per cent in 1921, as against 73 per cent in 1914. Meantime, the share entering by the Pacific ports fell from 21 per cent in 1918 to 7 per cent in 1921, as against 7 per cent in 1914.

On the export side, the percentage now handled by the various ports also indicates a return to pre-war conditions. Owing to the demands of Europe, the exports of New York increased from 37 per cent of the total in the fiscal year 1914 to 48 per cent in 1917, while the share of the Atlantic frontage as a whole increased from 55 per cent in 1914 to 70 per cent in 1917. The share of the Gulf ports increased from 11 per cent in 1916 and 1917 to 22½ per cent in 1921. With the reduction, however, in European demand, New York's percentage fell to 42 per cent in 1920 and 39 per cent in 1921, while that of the Atlantic ports as a whole dropped to 57 per cent.

Two Paradoxes

There are two noteworthy phenomena in American foreign trade: one, the innocent belief of some business men that they can continue to export indefinitely without importing, or, at least, without paying any attention to importing, leaving that to the other fellow; the other, the fact that we continue to sell far more than we buy, even though the aggregate of foreign trade has fallen away greatly. Says the Commerce Reports:

"The total value of the foreign trade of the United States in merchandise dropped from \$13,347,000,000 in the fiscal year 1920 to \$10,171,000,000 in 1921, a decrease of \$3,176,000,000, or at the rate of 23.8 per cent. This loss was nearly equally divided between imports and exports. Imports dropped from \$5,238,000,000 in 1920 to \$3,654,000,000 in 1921, a loss of \$1,584,000,000, or 30.2 per cent; while exports, amounting to \$5,109,000,000 in 1920 against \$6,516,000,000 in 1921, decreased \$1,593,000,000 in value, but only at the rate of 19.6 per cent. . . .

"The much earlier and proportionately greater drop in imports caused considerable surprise. In the face of depreciated exchange rates of European currencies the United States was generally considered a favorable market for selling, and it was freely

predicted that this country would be overwhelmed with shipments of European goods of low production cost. As a matter of fact imports from most countries in Europe were less in 1921 than in 1920, although those from Belgium increased by \$13,000,000 and from Germany by \$46,000,000. At that last year's imports from Germany of \$91,000,000 are less than one-half the pre-war imports from that country."

How long can these conditions continue? If the government receives any interest on its loans to Great Britain, France and the other associated nations, payments necessarily must be in goods. Then, at least, we shall be compelled to accept imports. But we talk of foreign trade today and tomorrow build a tariff wall; we talk of employing our merchant marine, only to shut out Australian wool and British manufactured goods; we have become, in short, persons who eat our cake and have it too.

Page Freight Report

San Francisco, Sept. 15, 1921.

Our last report was issued August 24. The activity in chartering has continued, although on a lower scale of rates, as both the wheat and barley markets in Europe went off somewhat in price.

From the North, Northern Grain & Warehouse Company chartered steamer Hilversum at 63/3, Ravenrock at 61/3, also steamer Terrier at 57/6, and Arnot Mendi at the same rate. Kerr-Gifford chartered steamer Ashworth at 60/— and steamer Hercules at 57/6. Balfour, Guthrie chartered steamer Norman Monarch at 57/6 and M. H. Houser steamer Havre Maru and Orient City on private terms, all to load at Portland with wheat and/or flour to U. K. Continent, Bordeaux-Hamburg.

From San Francisco Dewar & Webb reported to have chartered steamer Hellen on private terms, Balfour, Guthrie steamer Crosshill at 66/3 for barley. Strauss & Company chartered steamer St. Dunstan at 61/3 for barley and later the Greek steamer Iolcos at the lowest rate for some time, namely 55/—, No doubt the high rate of insurance on Greek tonnage was the cause of the owner taking such a low rate. At this writing cables indicate that the barley market is very weak in England, though wheat is in good demand, and there seems inquiry for tonnage at 57/6, from Portland.

A good deal of lumber has been arranged by the regular liners on the basis of \$15.50 to Australia and on the basis of \$17 to \$17.50 for the

West Coast of South America. The schooner Vigilant has been chartered by the Robert Dollar Company for lumber from the North to Caliao, at \$17. J. J. Moore & Company chartered Japanese steamers, Vancouver Maru and Kaiky Maru, for lumber and Japanese squares to Japan, at \$13 and \$13.75 respectively. The Munson Line are reported to have just chartered one of their steamers to bring coal from Virginia to San Diego at the low rate of \$4.48 per ton, free of canal dues, and she has been chartered, we understand, probably by the Willapa Lumber Company, with a return cargo of lumber to New York at \$20 per thousand.

Some low prices have been made for sailers sold at auction. You will remember the Chillicothe was bought for \$25,000 by James Blaine of Seattle and the Moshulu sold at auction in San Francisco at \$29,500, bought by the Charles Nelson Company. The iron sailer Phyllis, sold during the war by Comyn at \$275,000, only realized \$24,500 at auction in New York. The City of Portland is reported to have been sold by auction in Savannah for \$10,000 and the Betsy Ross, motorboat, was reported sold up North this week for \$5000, but we have just heard that the sale has not been confirmed and that someone has made a private bid for \$7500. Even at these low prices it is quite likely that the above vessels will be laid up for a while until the owners can be sure of a paying freight for a round voyage, either to the Orient or the West Coast of South America or to Australia.

PAGE BROTHERS,
BROKERS.

Beyfuss Freight Report

San Francisco, September 22, 1921.

During the past four weeks there has been no decided change in the freight markets off this coast.

Barley chartering has been very light with rates about 60/— San Francisco to U. K. or Continent. Wheat fixing has been quite active, more than a dozen steamers being chartered, mostly from Columbia River to U. K. or Continent at rates of 55/— to 69/—. No American steamers are reported but three Spanish steamers are coming here for this business.

There has been no improvement in lumber rates from owners' viewpoint, although there is much inquiry for lumber from the Orient and several full cargoes are re-

ported at about \$12.50 per M feet B. M.

Lumber chartering to Australia for sailing vessels is very quiet, charterers' ideas being about \$14 to Sydney, but no fixtures have been made as low as this.

West Coast of South America is also very quiet, one vessel has been reported chartered, a large sailing vessel of about 18800 M feet fixed at \$17—to Callao.

Nitrate freights are still flat with no transactions reported.

C. BEYFUSS CO.,
BROKERS.

New Matson Service

The Matson Navigation Company

announces a triangular freight service between San Francisco, Los Angeles and Hawaii, to begin with the sailing of the steamship Hyades in October. For many years Los Angeles has desired a direct service to Hawaii, but except for a few voyages of the Hill liner Great Northern in 1915 and 1916 its wish has been in vain. The Hyades will be operated on a 35-day schedule. Freight offerings from Los Angeles to the islands and return are quite promising, and another vessel may be placed on the run later. Calls will be made at all island ports for which sufficient business offers. No passengers will be carried.

export and import cargoes, with headquarters in Washington; W. L. Bull, trade supervisor of the traffic department; J. P. Sutherland, head of the passenger branch of the traffic department.

Captain Y. Yabe, chief of the Yokohama harbor office and president of the Yokohama Y. M. C. A., has been sentenced to one year's imprisonment and a fine of yen 1200 following conviction in the Yokohama customs scandal. S. Hara, a director of the Toyo Kisen Kaisha, was fined yen 300. Of 88 persons tried, 83 were convicted.

John Callan O'Laughlin, special assistant to the chairman of the Shipping Board, has resigned to return to private business. He has been succeeded by Ralph Solliitt, formerly assistant to Postmaster General Hays and also a vice-president of the Munsey Trust Company of Washington. Mr. O'Laughlin intended to stay only a short time when he went to the board to assist Mr. Lasker in the reorganization.

R. L. Francis, formerly assistant freight traffic manager of the United American Lines, is now manager at Philadelphia, with E. M. Tyrrell as assistant. Wilmer M. Wood is appointed general freight agent, intercoastal service; E. W. Robinson is assistant freight traffic manager in charge of full cargo traffic, both having headquarters in New York; and Clarence F. Ray is assistant to the manager at Boston.

Deaths

Frank F. Boulton, president of the Maritime Association of the Port of New York, August 17.

Joseph C. Babcock, for 48 years assistant keeper and keeper of the Fairport, Ohio, lighthouse, July 4. He had retired in 1919.

Cristino Rios, of the Northern Shipping Corporation, 82 Beaver street, New York, at Ponce, Porto Rico, July 31.

Walter W. Ray, vice-president of Middleton & Co., export and import commission merchants, 68 Broad street, New York, August 13.

C. H. Olson, attorney of Honolulu, who had specialized in admiralty law, in an automobile accident on Maui September 5.

Phillip H. Van Tassel, formerly port engineer of the Oregon Railroad and Navigation Company, in Tacoma, Washington.

Yonosuke Mitsui, president of the Mitsui Bussan Kaisha, in Oiso, Japan, August 8. Mr. Mitsui was born in Kyoto in 1856. Prior to becoming president of the M. B. K. he was head of the Kanagafuchi Spinning Company.

Personals

Edward B. Germain, former general manager of the Bethlehem Shipbuilding Corporation's Harlan yard, has been made manager of sales of Bethlehem, with offices at 111 Broadway, New York City, and has been succeeded as general manager of Harlan by C. B. Weaver, former general superintendent.

Judge Walter D. Meale, former associate justice of the Appellate Court of Ohio, has been appointed by President Harding as chairman of the Shipping Board Claims Commission, which will consider claims of about \$211,000,000. Other members are: Homer L. Ferguson, president of the Newport News Shipbuilding & Drydock Company; F. W. Wood, former president of the Maryland Steel Company; Captain Richard M. Watt, C. C., U. S. N., and Arthur W. Teele, of the accounting firm of Patterson, Teele & Dennis.

Captain Alexander E. S. Hambleton, recently master of the White Star liner Adriatic and formerly of the Celtic and Baltic, has been appointed master of the new 35,000-ton Homeric, ex-Columbus. He has been succeeded on the Adriatic by Captain Hugh F. David.

George Banbury has succeeded E. J. Griffith, resigned, as employment agent of the Admiral Line with headquarters at Seattle.

F. V. Archer, formerly manager of Naumburg & Company, New York, Boston and Philadelphia, has become vice-president of the Thatcher Propeller and Foundry Corporation, Albany, in charge of finance, cost, expenditures, etc., effective September 1.

Captain Edward L. Beach, U. S. N., commandant of the Mare Island Navy Yard, author of numerous novels dealing with naval life, will retire soon to become professor of

naval history, Stanford University. Captain Beach will occupy what is said to be the second chair of its kind in the country, the other being at Annapolis.

Rear Admiral Josiah S. McKean has been appointed commandant of the Mare Island yard, succeeding Captain Beach.

H. S. Eaton is acting assistant manager of the Pacific Steamship Company, San Francisco, succeeding M. F. Copley, transferred.

Dan Cook, formerly of the General Steamship Corporation and Pacific Mail, is now traffic manager on the Pacific Coast of the Compagnie Generale Transatlantique, the agency for which is held by the Trans-Oceanic Company.

H. T. Anning is general agent of the Atlantic-Gulf & Pacific at Portland, Oregon, succeeding C. R. Sheridan, transferred to the San Francisco office.

George A. Armes, president and general manager of the Moore Shipbuilding Company, Oakland, has resigned and has been succeeded by Joseph A. Moore, vice-president, who in turn is succeeded by Ira Lillick. Mr. Armes went from the Shipping Board to the Moore yard at the height of wartime construction and had a great part in Moore's successful work.

Gordon Gliddon, general sales manager of the Moore Shipbuilding Company, who had charge of solicitation of business, principally repair work, has resigned to take up similar work with Barnes & Tibbitts.

George H. Wells has been appointed by the Shipping Board to serve in the traffic department, New York. Other appointments in the same department are: F. G. Freiser, head of the department of competitive inland freight rates and competitive

SAVING THE CANADIAN IMPORTER

By G. W. GORE
Master of Tug Sea Lion



The sea-going tug Sea Lion of the Ship Owners' and Merchants' Tugboat Company

AUGUST 13, 1921, the steamer Canadian Importer, a vessel of 8800 tons, belonging to the Canadian government, left Vancouver, B. C., loaded with four million feet of lumber, bound for the various ports of Australia. Being a long-legged brute, drawing 26 feet on even keel and of narrow beam, with a high deckload, the ship was inclined to be somewhat cranky.

After rounding Cape Flattery, the course was set to the southward and westward and soon after passing out, the steamer took a decided list to starboard. As she had done the same thing on previous voyages, nothing much was thought of it at the time. The Canadian Importer was kept on her course, but the list kept on increasing, until water finally poured into the fire room from number two hold, shortly afterwards putting out the fires under the boilers and rendering the ship helpless.

In this position she lay, gradually listing over, as the water poured into the fire and engine room, until the ship had a 30 degree list to starboard and the after end of the steamer was flooded, the water finally reaching to the height of the cylinder heads on the main engine, a depth of 26 feet, leaving the ship in a most precarious condition.

On the 19th of August, the day after the steamer filled, a volunteer crew of the second and third offi-

cers and nine men set out in one of the ship's lifeboats, seeking assistance for their disabled craft.

After a harrowing experience of fifteen days in an open boat the crew were eventually picked up.

In the meantime the steamer Cordova sighted the Canadian Importer and sent in wireless calls for assistance to be sent the helpless steamer; then left in search of the missing lifeboat.

Friday, September 2 at two p. m. the tug Sea Lion loaded with fuel and an ample supply of provisions proceeded to sea in search of the Canadian Importer, then lying helpless 600 miles off shore.

Passing through the north channel at three p. m., Point Reyes was made as darkness shut in. Our course was set a little to the southward of the last position of the Canadian Importer, as received by wireless, allowing for the drift the steamer was making to the south-east.

Perhaps it was intuition, but at any rate gave the second officer on watch orders to keep a strict lookout for the missing crew in the lifeboat of the Canadian Importer.

Repeated the same orders to the chief officer who came on watch at midnight, also remarking that no doubt they would show a light, if we came anywhere near them. At 12:45 the first officer called me, stating that he thought the missing life-

boat was in sight. On looking through the darkness on the starboard hand, there appeared the red glow of a Coston signal, looking with its baleful glare, like the evil eye of some unknown denizen of the deep.

We knew at once it was the lifeboat, and immediately the wheel of the Sea Lion was ported until we were heading for them, the range lights on the tug at the same time showing those in the lifeboat that their signal had been seen.

At one a. m. we arrived alongside the lifeboat, having hauled the Sea Lion into the wind and sea in such a position as to make a lea for them on the starboard side of the tug.

Words could not express the delight of the two officers and nine men as they knew they were once more safe on board ship. As they struggled over the side of the Sea Lion, assisted by our crew, they surely presented a sorry and unkempt appearance, the result of fifteen days' exposure to the elements of sea and sky in an open boat. Weak and unshaven, but all alive, they were soon drinking copious draughts of hot coffee and eating to fullness the many sandwiches our good cook prepared for them. Drying out their clothing and making them comfortable for the rest of the night was the work of a short time.

With true maritime spirit they all decided to go back with us to their ship. Come daylight, a hearty breakfast and later hot salt water baths and a change of clothes, with judicious medical aid, soon had them all feeling better and improved in spirit one hundred per cent. There was a moderate northwest wind blowing but a large westerly swell running, when the lifeboat came alongside the tug. After three ineffectual attempts to lift the boat in the Sea Lion's davits, decided to tow her astern. Monday, September 5, at nine a. m., we arrived alongside the Canadian Importer and put the crew of the lifeboat, now greatly improved in body and spirits, aboard their ship.

The deckload of the steamer had been cast overboard and she had been partially pumped out by the use of wrecking pumps, put aboard by the British wrecking steamer *Algerine*, leaving the ship with only a ten degree list to starboard.

The Canadian Winner, a company ship of the same line, was towing the disabled steamer, but immediately let go on our arrival and that afternoon departed for Puget Sound.

The Sea Lion's hawser was made fast to the port cable of the Canadian Importer, and we started on our long tow from latitude 38-55 north, longitude 135-24 west for the port of Victoria, B. C., being accompanied by the steamer Canadian Observer as an escort. The weather at this time was fine, clear and smooth.

At nine p. m. on September 6 the tug *Sea Monarch* hove in sight and putting hawser aboard the steamer the two tugs continued on their long journey.

With the exception of two days strong northerly winds, fine weather was experienced throughout the trip, the steamer steering better with wind and sea ahead than with the wind abeam or astern.

We reached Victoria at eight a. m. September 13, just one month after the Canadian Importer had started

on her illfated trip, having towed the ship a distance of 803 miles in seven days and twenty-one hours, an average of 4.24 knots per hour under all conditions of weather, wind and sea.

At eleven a. m. docked the Canadian Importer at the outer dock in Victoria harbor, being greeted with hearty cheering by the vast crowd assembled to meet the arrival of the helpless steamer.

The two tugs were objects of great interest to the many who passed along the piers where they were tied up, and many favorable comments were made on the successful feat they had just accomplished.

At three p. m., as the *Sea Lion* and *Sea Monarch* left for San Francisco, they were given three rousing cheers by the crew of the Canadian Importer and the crowd on the dock. The powerful tugs which had so ably represented the Ship Owners' and Merchants Tugboat Company took their departure from the harbor of Victoria.

BOOK REVIEWS

Zimmermann on Ocean Shipping, by Erich W. Zimmermann, Ph. D., professor of commerce, James Millikin University, Decatur, Illinois; 692 pages, with numerous tables, diagrams, and illustrations, completely indexed. Bound in blue buckram with gold stampings. Published by Prentice-Hall, Inc., New York. Price \$5 net.

This book has an initial merit of being brand new, having been published in May of this year. Its treatment of this very important subject is, therefore, sufficiently modern to be tinged with the depression in business which has brought America face to face with the real problems in shipping. The prime raison d'être is the "emphasis placed on the inter-dependence of shipping and commerce."

The book is written purely from an American standpoint and is divided into nine parts. Part I deals with the ocean, particularly in reference to trade routes. Part II treats of ports and terminals, including the idea of free zones, physical requirements, handling facilities, and everything that goes to make up an efficient modern seaport. Part III deals with the ocean carrier; Part IV with the cargo; Part V with shipping services; Part VI with marine insurance; Part VII with organization and management; Part VIII with rates and finances;

and Part IX is devoted to a short history of America's merchant marine, the larger part of this last section being devoted to a chapter on the work of the United States Shipping Board, and another chapter on the Merchant Marine Act of 1920.

This book should prove very valuable both as an original text and as a handbook for business men interested in ocean shipping. If desired, orders may be placed through Pacific Marine Review.

"I'll Tell the World," the Story of the World Trade Cruise—Anderson Overseas Corporation, 165 Broadway, New York. A 16-page booklet setting forth the plan for a world trade cruise by the famous American trans-Atlantic liner *St. Louis*.

For the purposes of this cruise the entire main deck and portions of the promenade deck of this vessel have been set aside for exhibits. The exhibit space amounts to approximately 30,000 square feet, so that this tour would be equivalent to "taking Madison Square Garden around the world." Power is made available for the operation of any machinery exhibit, and ample space is assigned on other decks for the storage of material, literature, etc., as may be needed by exhibitors. Office accommodations are also to be provided, and banking institutions

with large foreign connections will be given an opportunity to have representatives accompany the expedition.

While orders may be taken freely, no goods of any kind will be sold out of the ship. Literature should be prepared in English, French and Spanish, and possibly also in Portuguese for Brazil.

The tentative itinerary comprises a start from New York; thence down the east coast of South America, touching at various Brazilian ports, to the River Plate ports; thence across the South Atlantic to Capetown, and up East Africa to Delagoa Bay; thence to Mauritius and across the Indian Ocean to Australia, touching at Perth, Adelaide, Melbourne and Sydney in Australia and at Wellington in New Zealand; thence to Yokohama, Japan, and along the east and south coasts of Asia, touching at all important points through the Suez Canal, the Mediterranean, and along the west coast of Europe to Bergen, Norway; and thence back to New York.

Basic rates with charts of the ship will be furnished on application, and all details may be arranged by conference. Exhibits will be stored safely and free of charge until the ship is ready.

The vessel is now undergoing extensive reconditioning.

MACHINERY AND EQUIPMENT

THE MOST MODERN STEAMER

OUR marine engineering friends will be interested in some of the details of the propulsion plant and auxiliary machinery of the new Cunard liner *Scythia*, recently introduced into the Southampton-New York service.

The *Scythia* is considered by many European marine experts to be the most advanced liner afloat from a marine engineering standpoint. She is notable as being the first Class A liner to be designed and built for burning fuel oil under her boilers. Briefly her dimensions are: length 625 feet; breadth 74 feet; molded depth 45 feet; draft 30 feet; gross tonnage 20,000 tons; displacement 27,000 tons; speed average at sea 16 knots. She is fitted for 337 first-class passengers, 331 second-class, and 1538 third-class.

She was built by Vickers Limited, Barrow-in-Furness, England. The passenger accommodations are very spacious and luxurious, and she is noteworthy among European-Atlantic liners in that running water is provided in all first and second-class cabins.

Power Plant

The *Scythia* is the first Class A liner in which double reduction gearing is installed. The driving machinery consists of two sets of Brown-Curtis compound turbines, each set developing 6250 S. H. P., with provision of additional nozzles on the high pressure turbines so that the total S. H. P. may be increased by 1000. The H. P. and I. P. ahead turbines are arranged in tandem in the same casing, and in this casing also one astern element is assembled. The L. P. ahead turbine and the second astern element are coupled together in another casing on the opposite side of the gear case.

The speed of the H. P. turbine rotors is 3200 r. p. m., and the speed of the L. P. rotors 1816 r. p. m. These speeds are reduced through suitable double reduction gearing to 80 r. p. m. at the propeller shaft. Adjustable blocks of the Michell type are fitted to the turbines and also

on the main shafts next to the gearing to take up the propeller thrust.

The condensers are underslung, being bolted through to the low pressure turbine casing, an arrangement which insures freedom from drainage water in the low pressure turbine.

The plant supplying steam for these turbines consists of three double-ended Scotch marine boilers, each 17 feet 6 inches diameter by 22 feet 6 inches long, and three single ended boilers of the same type and same diameter by 11 feet 6 inches long. Morrison suspension type furnaces are used, four to the boiler end. Howden forced draft system, Schmidt's superheaters, and the Wallsend-Howden oil fuel burning apparatus are used, the boiler fronts being arranged for quick conversion from oil burning to coal, or vice versa. There are four complete sets of pumping and heating plants for insuring oil to the furnaces of these boilers.

Auxiliary Plant

Much of the auxiliary machinery and practically all of the deck equipment is driven by electricity. Two sets of turbo-driven generators, each of 375 K. W. capacity, are supplied for providing electric current for this equipment.

In connection with the electric installation there is an emergency oil engine driven motor generator installed on one of the upper decks for supplying current for lights, wireless, and steering gear in the event of the main electric generator engine room being out of action through flooding of that compartment or accident to the machinery. This precaution is in line with the traditions of the Cunard Company, who take great pride in the record of their ships for safety of passengers at sea. Such an installation should, in the judgment of the writer, be placed on every passenger ship, as it would go a long way toward eliminating many of the horrors incident to sea disaster at night and would certainly be a great aid in preserving the morale of the

crew and passengers in time of danger.

Electric Deck Machinery

Another innovation for a large steam vessel is the use of electro-hydraulic winches for handling cargo and baggage, and capstans and windlass on the same system for warping ship, handling anchors, etc. This system abolishes steam and exhaust pipes for the deck machinery, saves much fuel, and makes all of this machinery immediately available, no time being lost in warming up steam pipes, etc. In the event of the main boilers being cold, the vessel may be warped and cargo worked with current derived from the emergency dynamo plant mentioned above, or if working cargo in port, the winches may be supplied with power from a cable from shore supply. The arrangement is very simple. There are no heavy reciprocating parts and consequently no noisy operation, and the cargo being stowed and the hatches battened down, that part of the deck becomes part of the promenade, a very desirable feature on passenger liners. The steering gear is Brown Brothers' electro-hydraulic.

The *Scythia* shows a reversion to an older type of ship in her slow speed propellers, moderate sea speed of ship, and one funnel arrangement of draft for boilers. This latter characteristic enables the designer of a passenger vessel to house comfortably in the same length of ship a very much larger number of passengers than is possible with multiple funnels. For this reason and on account of the high fuel economy to be expected from her well designed boiler and turbine plant, it is confidently expected by her operators that the *Scythia* will prove a very profitable type for the North Atlantic trade.

Four of these ships are being built and seven vessels of a similar type 520 feet in length, these smaller vessels carrying 12,000 tons of cargo and about 500 passengers.

A BLOWPIPE TEST

THE Bureau of Standards invited the commercial manufacturers of oxy-acetylene blowpipes to submit their apparatus for the purpose of test. An elaborate equipment was prepared, consisting of—

- A. Weighing system for determining the amount of gases used during tests by loss of tank weight.
- B. Gage board system containing necessary pressure gages, regulators, and orifice flow meters.
- C. Welding table.
- D. Cutting table.
- E. Flashback and safety testing apparatus.

The illustration accompanying this article shows diagrammatically the complete arrangement of this apparatus.

Extreme precautions were taken to insure accuracy of test, and it is claimed that the values obtained for gas consumption were equal to at least 0.005 pounds per hour. Practically absolute uniformity of pressure was maintained during the tests.

The welding table was carefully prepared with a firebrick top surmounted by a heavy casting which was channeled so as to permit of better heat radiation along the line of the weld, and the line of weld was directly in front of the operator and the welding performed from the back toward the operator.

The cutting table was arranged for mechanical operation so as to eliminate the personal equation, all tests being made by a mechanically controlled device under exactly the same conditions.

The summary of the conclusions drawn from these tests by the experts of the Bureau of Standards is given below. These conclusions are extremely interesting, as they indicate that there is ample room for research work in the improvement of oxy-acetylene blowpipes.

For the Cutting Blowpipes

A. That there is today no generally accepted theory for proportioning, for the cutting of metal of various thicknesses, the volume and velocity of the issuing cutting jet, with the result that none of the apparatus submitted to test proved economical for all thicknesses.

B. That there is for any thickness of metal cut a limiting velocity of exit of the cutting jet at which complete utilization of the oxygen takes place and a limiting value for the amount of oxygen required to produce a cut.

C. That an increase in acetylene consumption, of oxygen consumption, or of the velocity of exit of the cutting jet beyond the limiting values,

A very interesting paper was read before the spring meeting of the American Society of Mechanical Engineers, May 23-26, 1921, at Chicago, Illinois, reporting the results of an elaborate series of tests which were carried out in the Bureau of Standards, Washington, D. C. These tests were made for the purpose of analyzing the processes of cutting and welding by the oxy-acetylene blowpipe. The paper was read by R. S. Johnston, engineer physicist of the United States Bureau of Standards. The present article is an abstract of this paper.

does not produce increased efficiency in commensurate ratio.

D. That a large majority of the blowpipes tested were equipped with excessive preheating flames for the thickness of metal the tip is specified for, and that such excessive-sized flames are disadvantageous both from the standpoint of economy of operation and quality of work performed.

E. That considerable improvement in economy of operation seems possible in cutting material of two-inch thickness and that possibly this condition may be found to exist for metal of other thicknesses than those used in the tests.

F. That the maximum thickness

of metal that may be economically cut with an oxy-acetylene blowpipe of standard design when neither the material nor the oxygen is preheated and the cutting is done only from one direction, is about twelve inches.

G. That cutting blowpipes due to their incorrect design are subject to the same "flashback" troubles found in the welding blowpipes.

For the Welding Blowpipes

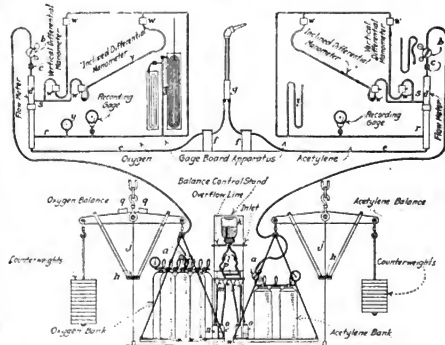
A. That the blowpipes most subject to the so-called phenomena of flashback are those in which the oxygen is delivered at a pressure in excess of that at which the acetylene is delivered.

B. That all the blowpipes tested, including those in which the acetylene is delivered at an excess pressure as well as the so-called equal or balanced-pressure blowpipes, are subject to flashback phenomena on account of the inherent defects in their design.

C. That the cause of the development of the conditions producing flashback is the setting up within the blowpipe tip and head of a back pressure which retards or chokes off the flow of one of the gases.

D. That this back pressure is the result of confining or restricting the volume flow of the issuing gases at the tip end.

E. That any cause tending to restrict the flow of the gases sets up a back pressure which immediately causes a change in the amount of each gas delivered to the mixing chamber.



Diagrammatic representation of apparatus used in blowpipe test

F. That a fluctuating gas-volume ratio, due to restriction of volume flow, from whatever cause, prevents a blowpipe from maintaining constantly and at all times during operation the desired "neutral flame."

G. That a blowpipe that cannot maintain under all operating conditions a neutral flame cannot logically be expected to produce sound welds.

H. That all the blowpipes tested during this investigation either through improper gas pressures or improper interior design, or both, are incapable of maintaining a neutral flame (constant-volume gas ratio) under all conditions of restricted gas flow and are therefore incapable of producing sound welds

where there is any liability of the gaseous products of combustion being momentarily confined, such as occurs in practically all welding operations.

I. That the ability of a blowpipe to consume an equal volume ratio of gases when burning freely and undisturbed in air is no criterion that it is capable of producing sound welds, i. e., that it is not subject to detrimental fluctuations in gas ratio during a welding operation, and is therefore capable of maintaining a neutral flame under all operating conditions.

J. That whether a blowpipe of present designs will consume an equal volume ratio of gases when burning freely and undisturbed in

air depends on how nearly correct the operator sets the so-called "neutral" flame, and experience indicates that the average operator checks the acetylene gas flow too much and actually develops an oxidizing rather than a neutral flame.

K. That the question of the possible limiting strength and ductility or the efficiency of welds made by the oxy-acetylene welding blowpipe must await the development of a more satisfactory instrument, and that having such an instrument there is no reason to believe that a weld of clean, sound metal cannot be made with assurance during any welding operation and that such welds will or can be made to possess the proper physical properties.

A SHIPBUILDING PLANT'S ACCIDENT RECORD

AN analysis of the number of accidents which occurred in 1920 in one shipbuilding plant located on the bay near San Francisco reveals some interesting information. This plant employed an average of 2670 men daily. It employs a safety engineer who devotes his whole time to accident prevention work, and is assisted by safety committees, composed of men employed in the various crafts about the plant. The closest co-operation obtains between the higher officials, the safety engineer and the employees.

During the year 1920, there were no fatal accidents in the plant. There were recorded fourteen cases of permanent disability, 116 compensable cases which resulted in more than seven days lost time and 78 cases with less than seven days lost time.

Objects falling from an elevation, such as bolts, nuts, liners, or tools from off a scaffolding, caused the greatest number of accidents, viz:

5 permanent, 24 compensable, and 13 non-compensable cases, a total of 42. The next highest number from any one cause is charged against the handling of material, viz: 3 permanent, 18 compensable, and 8 non-compensable, a total of 29. Hand tools caused the next largest number of accidents, viz: 2 permanent, 10 compensable, and 8 non-compensable, a total of 20. Falls of persons from elevations appear next in order, having caused 1 permanent, 13 compensable, and 5 non-compensable, a total of 19. And so down the line through some twenty classifications of causes, the three last ones being charged with one accident each.

A close study of this tabulation shows the need of the employee being educated to look out for his own and the other fellow's safety to a greater extent than he does today. The management of this plant has been preaching safety to its employees ever since the yard started and has installed safety guards on all of its machinery. The installation of these guards has substantially affected the accident record. Out of 208 acci-

dents which resulted in a loss of time of one day or over, only 12 were caused by working machines and 4 by hoisting apparatus.

It may be seen that quite a lot may be accomplished in accident prevention work by safety committees and education of employees in safe practices. An educational propaganda composed of lectures, short talks and bulletins, and aided by continuous vigilance on part of foremen is bound to reflect a reduced number of accidents.

Safety, efficiency and production go hand in hand. The shipbuilding industry on the Pacific Coast has reached the point where the necessity for increased production must take into its reckoning time lost by reason of accidental injuries.

The employee who has his interests at heart must co-ordinate his efforts with those of the employer and he may best contribute toward the desirable end by exercising the greatest of care and religiously following the safety rules issued primarily for his benefit.

L. DEE MILLER
in California Safety News.

BOOK REVIEW

Eighth National Foreign Trade Convention Official Proceedings. Octavo; bound in buckram, with gold stamps; 600 pages, price \$2.50.

The experience of American business men engaged in foreign trade in all parts of the world, the views of the leaders of American industry on the problems now confronting foreign trade, and the advice of technical experts on all phases of conducting foreign trade, are to be found in the Official Proceedings of the Eighth National Foreign Trade Convention.

This volume includes the prepared

addresses and the stenographic report of informal discussion. Each delegate to the convention will receive one copy without charge. In order that delegates may obtain any additional copies desired, and that those who were not able to attend the convention, and others who are interested in promoting American foreign trade may obtain copies, a limited edition will be placed on sale.

The general theme of the Eighth National Foreign Trade Convention was, "American Foreign Trade and Its Present Problems." Five general sessions were held at which matters

of general policy were considered. There were also eleven group sessions at which methods and means of meeting the immediate problems were discussed in detail.

This convention was the most practical yet held; delegates were in attendance from all over the world. From the report of this gathering can be obtained the most comprehensive and authoritative statement of the steps already taken, and of the measures and policy necessary to secure the fullest development of our foreign trade, and to enable American industry to take its proper place in the world markets.

LARGE OIL AND ORE VESSEL LAUNCHED

THE first of the combination ore and oil vessels building at Sparrow's Point plant, Sparrow's Point, Maryland, of the Bethlehem Shipbuilding Corporation, Ltd., was launched on July 12, 1921. Delivery is scheduled for about the middle of September. This vessel, the G. Harrison Smith, is being built for the International Petroleum Company and is one of four ships of this type under construction at Sparrow's Point, the other three being for the Ore Steamship Corporation.

The G. Harrison Smith is distinctive in that it is the largest vessel ever constructed at this plant, having a deadweight capacity of 20,000 tons and a length overall of 571 feet, 6 inches. It is designed for carrying a full cargo of either ore or oil in separate compartments. The



Launch of the G. Harrison Smith, 20,000-ton combination ore and oil carrier, at the Sparrow's Point plant of the Bethlehem Shipbuilding Corporation.

ore cargo will be carried in a narrow elevated hold 30 feet wide and 360 feet long. It is divided by watertight bulkheads into three compartments, each of which is served by three large hatches extending the full width of the ore hold.

The oil space, alongside and below the ore space, is divided by a longitudinal bulkhead extending from the keel to the ore hold. The foremost and aftermost compartments are for fuel oil and the tanks between these are for cargo oil. There are no summer tanks.

The wing spaces, acting as expansion trunks, on account of their depth afford the greatest possible flexibility for carrying liquid cargoes of varying density and adjusting the trim under all conditions of load.

AN APPEAL TO EMPLOYEES

By R. M. MacLEOD,

Safety Engineer, Los Angeles Shipbuilding and Drydock Company

"SAFETY FIRST" is not a catch word. It is a business proposition.

It is good business for the employer to cut down accidents, but it is better business for the employee. The only direct effect to the employer is the lowering of insurance costs, but the direct and indirect effects to the worker are incalculable.

The California Workmen's Compensation, Insurance and Safety Act provides for the payment by the employer to the employee of 65 per cent of his average earnings, with a maximum set at \$20.83 per week, that is, no man no matter how much he receives in wages, can draw more than \$20.83 per week in compensation, and the amount may be reduced 50 per cent if the accident is the result of wilful misconduct on the part of the injured employee. Under the act, no compensation is payable for the first seven days of disability. Therefore, a direct result to a man, earning 80 cents per hour, is loss of wages for the first seven days of disability, in addition to an actual monetary loss of \$17.57 per week thereafter, to say nothing of the physical pain and suffering endured.

How many of you who read this can afford to lose one week's wages, and then have your wages for the balance of the time you are laid up cut one-third or more?

In case of permanent total disability, the most that can be paid is 65 per cent of the average weekly earnings for two hundred and forty

weeks, and 40 per cent of such earnings for the balance of life. In the case of a man earning 80 cents per hour, this 40 per cent amounts to \$14.59 per week, a rather small amount on which to support a family. The commission can legally allow a disability rating, only where the person injured is actually unable to earn a living on account of the injury.

The time which is lost by careless men, time directly and indirectly lost on account of accidents, time lost in treatment of minor injuries and redressings at the yard hospital, time lost talking over accidents, and compensation payments, necessarily must all react in some degree against the best interest of the working man.

A plant in which the accident rate is very high has the cost of its products increased so that it can not compete with other plants whose accident costs are low.

If a plant can not enter its bid for business on an equal basis with its competitor, then in the course of time operations are suspended and a number of men thrown out of work; the result is an economic loss to the community. A single great catastrophe or a series of small economic losses directly affect the cost of living—and you suffer for it.

So you can easily see where, if it is good business for the employer to cut down accidents, it is much better business for the employee. Think it over and you will come to the conclusion that "Safety First" pays dividends to you.

Most employers, and in particular those in this state, safeguard their machines, and remove, as much as is possible, every accident hazard. However, in any plant, no matter how many safeguards are applied or how much the accident hazard is reduced, accidents will happen. To only one thing can this be charged—carelessness.

With the assurance that this plant is endeavoring to do all possible to ward accident prevention, we ask in your own behalf and that of your families, that you co-operate with us by way of exercising due care in performing your various daily tasks.

SERVICE BUREAU AMERICAN WOOD PRESERVERS' ASSOCIATION

THE Service Bureau has been established to promote the use of wood properly treated to resist decay, marine borers, and insect attack, thereby aiding in the conservation of the forest resources of the nation by making one stick of timber do the work of several.

The value of wood for construction purposes is fairly well understood but for permanent structures treatment with a standard preservative, such as creosote or zinc chloride, is absolutely necessary.

The policy of the Service Bureau is to give the public reliable information on the treatment of timber.

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Pacific Marine Review

The National Magazine of Shipping

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Pacific Marine Review

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THE AMERICAN MERCHANT MARINE

An Analysis of the Task Before the American People

By ALBERT D. LASKER

Chairman, United States Shipping Board*

UNTIL there is an awakened consciousness on the part of all citizens of America that economic stability is dependent on the disposal of our surplus wares and products in world markets, there can never be an American merchant marine.

Until the farmer in Kansas, the industrial worker in Indiana, the miner in Arizona, realize that the regularity and volume of their daily wage is, in a measure, as dependent on the establishment of an American merchant marine as is the continuity of employment and the wage of the dock worker in Baltimore or San Francisco, there can be no assured hope that the flag of the United States will be maintained as it should be on the seven seas. Sound economics accept as fundamental that national prosperity is based on continuity of employment at wages consonant with American standards of living.

Surplus Demands World Market

When surpluses accumulate, prices are demoralized and employment ends until the excess has been consumed.

As long as America had a virgin empire to explore and develop, the need generally for world markets to consume surpluses was not pressing. In our beginning, with thirteen states, a narrow strip along the Atlantic, we were a seafaring nation; and immediately after the war of 1812, under wise protective laws, the American flag floated proudest of all on the seas. Beginning with the period of forty-nine, the opportunity for wealth in our uncharted and undeveloped central and western empire challenged the imagination of America's youth, and the lure of salt water gave place to the call of the unclaimed riches that awaited the overland emigrant.

But, today, with forty-eight states, well populated with over 105,000,000 people; with world conditions changed by the great war; America, which, during the period of the conquering of its empire, was a self-consuming and self-sufficient nation by and large, now finds itself once more, if employment is to be general, with permanent surpluses which can only find outlet on the ocean.

Need for Merchant Marine

Generally speaking, the last ten per cent of production makes the market and it is this last ten per cent that we must insure disposal of to customers in foreign lands. Except with a merchant marine under our own control there can be no assurance of these essential markets.

When the Boer war came, Britain withdrew her ships from our trade, because she had need of them to carry

her own armies and her own supplies to the scene of battle. Had we then the need of world trade which we have today, America would have suffered indeed. The lack of ships for American trade in 1915 is too fresh in our memory to need stressing.

Napoleon said, "An army travels on its belly." This, too, is true of the navy. We have today the second largest navy in the world. And who can promise that in the next war we can call on allies for the bottoms needed to transport our army and feed and supply it and our navy? So, from the standpoint of peace, or the standpoint of war, America's stability calls for the insurance of a merchant marine. Thus, an interest in the problem and a sacrifice for its successful fruition becomes as important to the inland dweller as to the coastal population.

Sixteen weeks ago today the present United States Shipping Board took the oath of office and entered upon the stupendous task assigned it. This child of war's necessity had grown to huge proportions under such conditions as to present to the new board a task so tremendous that no one not directly associated with it can have a remote comprehension of its magnitude.

Task Facing Shipping Board

These sixteen weeks of strenuous endeavor have accomplished only a mere beginning, but a real beginning, of the foundation upon which a substantial structure of accomplishment, we hope, may, in good time, be erected. In June last the overhauled shore organization of the board and the Emergency Fleet Corporation consisted of some 8300 people, at an annual salary expense of nearly \$16,000,000, but in spite of this huge organization it was necessary for the present board to call into being an entirely new body of executives to handle the work that it found awaiting it.

As the summer passed, it became necessary to go to Congress for more funds, no appropriation having been voted for the current fiscal year to the old board. The urgent deficiency bill carried \$48,500,000, which was given to the board and the Fleet Corporation for the purpose of meeting current expenses. In addition, the board had already been voted \$25,000,000 to finish the last of the ships under construction and was permitted to use \$55,000,000 more for its current expenses, providing that it could find such sum or any part thereof from the liquidation of its assets. At the moment it would appear impossible, without an unconscionable sacrifice of assets, to realize any material part of this \$55,000,000 within the immediate reasonable future.

No Financial Statement

The new board found no financial statements of the condition of the board, either as to capital expenditures or operating history, which any business or business man could use as a guide. The accounting sys-

* Address delivered at a luncheon given by the Associated Advertising Clubs of the World, New York City, October 5, 1921.

tem that started with the operation of ships had simply collapsed and the new board's immediate problem was to create a system of accounting that would truly mirror the business of the corporation.

To build such an accounting and financial system on the shattered fragments that we found awaiting us was a task in itself to challenge the ingenuity of any organization. After sixteen weeks we find ourselves with the framework of our human organization (accounting, operating, financial, legal and liquidation) practically completed.

Cutting Overhead

With its new end, what is considered in some quarters, high-priced additions, the salary roll of nearly \$16,000,000 of June last has decreased to approximately \$12,000,000, and the number of employees represented by this pay roll to less than 6000. Financial reports are beginning to come in. On September 23 we had our cash statement as of August 31, the second cash statement that it has been possible for the new board to have since it took office.

On the same date our operating account for the month of August was presented, and three weeks ago the result of the inventory of all of the Shipping Board's materials and supplies (not including plants, ships or accounts) was available for the consideration of the board and for the adoption of a policy for liquidation. The reorganization of the various departments and offices is proceeding apace and it is hoped that results accomplished in months to come will show a satisfactory progress toward a plan of respectable operating efficiency, limited by the handicaps surrounding American shipping in general and government operation in particular.

America's Merchant Fleet

The American nation today finds itself in possession of a fleet of 1450 ocean-going steel ships of approximately 10,500,000 deadweight tons, not to mention a fleet of 10 ferro-concrete vessels of over 60,000 tons, and a wooden fleet of 285 ships of 1,000,000 deadweight tons. For practical purposes we need only consider the steel fleet, as the concrete and wooden ships will be eradicated.

Of these, nearly 1500 steel steamers, we may say, in round figures, that one-third of the number, comprising nearly one-half of the tonnage in deadweight, are excellent commercial vessels, one-third are fair commercial vessels, and the balance for all practical purposes are a total loss save for what salvage can be gotten out of them through ultimate sale or conversion, either in this country or abroad.

The reason that half the steel tonnage owned by the government rates from fair to not usable is that in the stress of war there was necessarily constructed whatever type of ship could be most expeditiously built, regardless of its ultimate commercial value in times of peace. To briefly illuminate why one-third of these ships were classed as not commercially practicable, in order to get the maximum production of war tonnage, some 300 ships were built in the yards of the Great Lakes. To bring these vessels to salt water, they must pass through the Welland Canal, the size of whose locks determine the size of these lake-built vessels. Most of these cannot be used on the Lakes, because they were built for sea service and do not meet fresh-water needs. Most of them are too uneconomical for ocean carriers to meet the competition of peace-time trade.

Cost of Construction

The cost of the construction of this fleet and its operation up to the present time is about \$3,500,000,000,

the total expenditure for all purposes. If the whole \$3,500,000,000 were written off today and the fleet carried as a total loss, this greatest of the government's war operations would not owe the American people one penny. Unfortunately, the billion dollars or more expended on airplanes performed no service at all in the war, but who can say, of the major factors, which was the determining one in bringing the war to its successful conclusion? Certainly there were several major factors, first of which was our valiant army itself, but none of the major factors counted more than the government's fleet.

True, most of this fleet was not finished until after the war's end, but Germany, knowing that the ships were to immediately come out of the yards, realized that she was fighting a losing game. The allies and America used their ships more profigately because they knew replacement was at hand. So that, potentially, the vast share of the fleet that was not finished until after the war really played a dominating feature in hastening the final decision.

Foreign Trade Carried

Nor could our upwards of \$20,000,000,000 worth of foreign trade have been carried on in the years between the armistice and the present had not this fleet been in existence. It was because of this fleet that we were able to move the enormous volume of American manufacture and raw materials at a time when there was a shortage of world tonnage. It was because of these ships that our factories, farms and mines were able to operate at top speed when the boys returning from the front were seeking employment. How serious would have been the situation had today's liquidation been in process when the country was called on to absorb into its economic life the 4,000,000 men who had so sacrificially borne arms in the world's great war.

So today we are left with this great fleet—many times the largest that has ever responded to the orders of a single owner—and the great question that confronts the Shipping Board, the problem toward which all of its organizing efforts have, so far, been directed, is the problem of the future of its vessels and of America upon the seas. For, in the successful operation of these vessels, lies the immediate hope of the establishment of an American merchant marine, and in an established American merchant marine lies our only assured hope of world trade, which means prosperity and happiness for America.

The fleet, under the control of the Shipping Board, which has been built and operated at a cost to the government's treasury of \$3,500,000,000, will no longer be an irksome burden to the taxpayer. The building program is practically finished. Only such ships are being completed as are cheaper to finish than to scrap. The \$25,000,000 appropriation from Congress, with possibly \$5,000,000 more, will, by the end of this year, see the last of the government-owned fleet ready for operation.

Tying Up Tonnage

The Shipping Board has steadily been tying up tonnage, primarily to stop its own losses, which has incidentally resulted in permitting continued operations by private owners, who could not run in competition with the government (even were the government willing) during the present world depression. It is the board's duty to see that the utmost tonnage possible is being carried at this time under the American flag, but it is also its duty to see that private operators are fostered and that the government's loss is minimized.

We believe we have our losses checked and hope to

require not more than \$5,000,000 a month for operations from now until the end of the government's fiscal year, June 30 next. Five million dollars a month is a huge sum, but small compared to keeping alive an organization with \$3,500,000,000 invested and operating and developing essential strategic trade routes, which must necessarily be run at a loss under the present trying conditions of world carrying trade. We cannot but believe that if we can produce a constructive policy, the taxpayer, hard pressed though he is, will not only approve of the continued operation at the present cost, but applaud same, in comparison to the previous loss entailed.

Liquidation

The liquidation of the \$3,500,000,000 of the corporation's assets will, at any time, realize but a fraction of the original cost, because the fleet was built with understandable waste and high expense during war pressure. The money loss in liquidation need not be considered, since it has already been written off in the cost of the war and, as here outlined, served a function in full value.

What remains, though, are the ships—potentially one of the greatest assets America has to insure its economic future, which means to insure the pursuit of happiness by its people.

What then are the problems that must be met to permit these ships to pass into hands of private owners, to be sponsored under the initiative and energy of private ownership? What are the problems that stand in the way of the operations of American ships privately owned? What are the problems that stand in the way of an assured American merchant marine? Permit us to inventory America's future on the seas, at this time when world shipping conditions in general, and America's in particular, are at the lowest ebb, in proportion to existing tonnage, possibly ever known in the history of seafaring man under economic conditions.

World Tonnage

When the tonnage of vessels now building throughout the world is completed, there will be afloat an increase of nearly one-third, as compared to the existing pre-war tonnage. True, abroad, as well as in this country, many war-built ships are now regarded as useless. This is even true of Britain, considered the foremost of shipbuilding nations. However, the effectiveness of ships today has not yet returned to pre-war standards. Disarrangement of trade routes, resulting in longer average voyages, is a factor that tends to counteract this excess, which is, however, vastly exceeded by the enormous dropping off in foreign trade.

The best estimate available today shows that in 1921, in tons of ocean freight, perhaps 60 per cent as much is moving as in 1913. Granting the premise that the last 10 or 15 per cent of trade makes or demoralizes the market, the possible 40 per cent deficit in ocean trade existing today eloquently speaks for itself.

Ocean Freight Market

As a result of this decrease in trade and the increase in ships since May, 1920, freights have fallen off and, as cargoes ceased to be available, vessel after vessel has been tied up, until now an amount of tonnage which practically represents the total visible excess of some 20,000,000 deadweight tons hangs over the ocean-carrying market, which will prevent an increase in freight to a remunerative basis for a longer time after trade improvement sets in. Half of this tonnage will never turn a wheel again, being unfit for profitable peace-time operations.

It is interesting to note that America is not alone stricken, as more than half of the laid-up tonnage fly foreign flags. Obviously, the nations who, for centuries, have been building trade routes, with generations of good will behind them, will feel the depression in much smaller measure than does our vast new American enterprise.

Ship Values

Because of the existing excess of tonnage, the values of bottoms have so dropped that time charters today are one-eighth of the going rates in the third quarter of 1919. A 10,000-ton steamer can be had under charter hire for a little over \$11,000 per month, as against \$100,000 when charter hire was at its height. In the face of these low rates the American owner finds himself confronted by the keenest of foreign competition, with the handicaps of higher wages, expensive victualing, and severe legislative requirements. Who will question that American living standards should be maintained on the seas as on the land, but to be maintained they must be paid for and the difference between American and foreign standards must somehow be met.

American ships cost more to build than foreign ships, because of higher American standards of living and, therefore, higher American wages. No American merchant marine can be created with ships operated under the American flag, but built in foreign yards. Domestic shipyards are as necessary to a merchant marine as the ships themselves, because, in case of need for tonnage when other nations could not or would not supply us, we might find ourselves with a woefully unbalanced fleet and, in time of war, without facilities for replacements and repairs.

American Operation

Therefore, from the standpoint of operation and original cost, with all it entails, America's new, young merchant marine is under financial handicaps of a major nature. Added to that, the sea routes of the world are controlled by other nations. Wherefore, we must spend, as every new business must spend, the moneys to get our share of the trade enjoyed by others. We are thus face to face with the question, What must be done that the American flag may not only be kept flying on the seven seas, but that America may take the place on the seas that her needs of world commerce and her position demand?

The merchant marine act of 1920, generally known as the Jones bill, has as its preamble a magna charta for America on the seas unsurpassed in the annals of our country's legislation:

"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it is necessary for the national defense and for the proper growth of its foreign and domestic commerce that the United States shall have a merchant marine of the best equipped and most suitable types of vessels sufficient to carry the greater portion of its commerce and serve as a naval or military auxiliary in time of war or national emergency, ultimately to be owned and operated privately by citizens of the United States; and it is hereby declared to be the policy of the United States to do whatever may be necessary to develop and encourage the maintenance of such a merchant marine, and, in so far as may not be inconsistent with the express provisions of this act, the United States Shipping Board shall, in the disposition of vessels and shipping property as hereinafter provided, in the making of rules and regulations, and in the administration of the shipping laws, keep always in view this purpose and object as the primary end to be obtained."

Administration Attitude

The Congress that passed this legislation was thoroughly conversant with the handicaps to American ocean trade. President Harding was a member of the committee that framed it and none more inspiringly co-operated than he. And it is my privilege here to announce and confirm that the same inspiration which guided him in his work on this bill as a Senator, lives with him as President. His interest in the successful application of the Jones bill and the establishment of the American merchant marine has increased from the time of the framing of the bill until today, as his responsibilities have increased from Senator to President. No man living more whole-heartedly and determinedly calls for a permanent policy for American shipping than President Harding. No man living desires more keenly a permanent American merchant marine commensurate with American needs than President Harding. It is the inspiration and determination of President Harding that give heart to the Shipping Board to carry the great burdens it bears.

Senator Jones, whose name the merchant marine act of 1920 bears, will live immortal in our sea history.

It is unfortunate that because of intervening conditions it is only now, sixteen months after the Jones bill became law, that there exists a Shipping Board which for the first time is ready to consider the great questions of policy and the mandates contained in that legislation, in the application of which may lie the ultimate life or death of America upon the seas.

The Jones Act

The Jones act was obviously framed with the recognition that, because of conditions surrounding American sea carrying which we have covered, no American merchant marine could be established without extraneous assistance being created for its benefit. The Jones bill provides for the creation of what is hoped will be such extraneous assistance. For instance, it provides that American mail shall be carried in American ships, thereby giving American tonnage the benefit of revenues accruing from postal service originating in this country; it provides for through preferential rates on railroads, to be allowed only when property or passengers are carried in American vessels; it provides for the abrogation of treaties restricting America's right to impose discriminating custom duties and tonnage dues.

It was the thought and hope of the framers of the Jones bill that the application of these three major and several other minor provisions would render American tonnage such extraneous assistance as to increase their earning capacity, so as to enable our merchant marine to cope with foreign competition, in spite of its higher original cost and subsequent greater cost of operations. The existence of these laws and mandates in the Jones act is only the forerunner of what must be done to bring their application into being. Until this time there has not existed, as is well known, a fully constituted Shipping Board with the organization to study the applications of the provisions of the Jones act. A wrong application of these provisions, instead of building an American merchant marine, may destroy it. The right application, it is hoped, will insure the end so much to be desired.

Shipping Board Responsibilities

The present Shipping Board has three great responsibilities: first, the operation of the fleet which it inherited, pending its sale to private owners; second, the liquidation of its assets; and third, but far more important of all, the application of the Jones act.

That it might devote itself intelligently and inspir-

edly to the Jones act, the first sixteen weeks of the existence of the present Shipping Board have been spent in building an organization to operate the fleet and liquidate its materials. This, in itself, is a stupendous task, but is one which we feel is on the high road to ultimate accomplishment. And thus now for the first time a United States Shipping Board finds itself positioned to study and apply the great charter given it by the merchant marine act of 1920.

Next Four Months

That study and collateral work necessary to the same must perforce occupy a considerable span of time. But if in the next sixteen weeks the Shipping Board can make as much progress in this greater problem of the study and application of the Jones act as it has made in the past sixteen weeks in the operation and liquidation of its physical assets, it will have accomplished what its most ardent well-wishers dared not hope for. Seemingly insurmountable obstacles must be met.

There are those who, for myriad reasons, do not wish the status quo changed. Unfortunately, there are possibly American owners who, feeling secure in conditions as they exist and which have injured and can inure to the benefit only of a few, of whom they form part, selfishly cannot see unbiasedly the greater picture of a greater American merchant marine and are loath to aid in bringing about any greatly changed conditions.

Obviously, we cannot gain trade on the seas without displacing the existing trade enjoyed by foreign ships. And these foreigners are ever at work, silently but surely, in their own national interest, for which we cannot blame them, to undermine possibility of an American merchant marine. The Jones bill must be given life by the present board. These hostile forces from within and without, sowing seeds of discord and distrust, must be met and vanquished.

No "Magic Wand Stuff"

Such an accomplishment cannot be realized, as President Harding has said, "by the waving of a magic wand." Those who are truly interested in the winning of the seas to America, in their impatience are crying aloud for results faster than they can be brought about, and, unwittingly, are the aiders and abettors to those who would destroy the possibility of an American merchant marine.

The Shipping Board, inheritors of a war-built business with all its consequent weaknesses; the Shipping Board, with all the opportunities for statesmanship which have been put on it by the Jones act, begs the patient indulgence of the country while it does the foundation work necessary to bring the Jones act into life. And if that confidence is lacking, or, if impatience from any quarters does not give opportunity to the Shipping Board to build truly and soundly, then is America's economic life on the seas, for the next generation, dark indeed.

America Must Realize Shipmindedness

For America, self-contained and self-sufficient while it was conquering an empire of magic wealth, finds itself now approaching the time of vast surpluses which must be sent out into the lauds of the worlds beyond the seas, if employment at home and maintenance and stabilization of domestic prices are to exist. We cannot rely on foreign bottoms to carry this surplus, for the foreign bottoms necessarily are owned by those nations which have the foreign trade, and when they find our competition pressing the most they will also find reasons and conditions not to give us the bottoms necessary to carry our commerce.

AN APPEAL FROM THE MIDDLE WEST

Interior Chambers of Commerce Interested in the Success of the American Merchant Marine

RESOLUTIONS constituting "The appeal of the Middle West for the establishment and maintenance of an American merchant marine" adopted at Cincinnati, Ohio, on October 7, 1921, at a meeting of the Chambers of Commerce of the Middle West held under the joint auspices of the Cincinnati Chamber of Commerce and the National Merchant Marine Association:

Whereas, the excessive ocean freight rates and the shortage of ocean transportation, caused in 1914 by the withdrawal of foreign ships, on which we have heretofore relied to get our product to foreign markets, cost our producers and shippers of the Middle West large sums of money; and

Whereas, the congestion of traffic and the consequent paralysis of our transportation and industrial systems, caused in 1919 and 1920 by our continued attempt to ship the great bulk of our exports through the "neck of the bottle" at the North Atlantic ports, cost us similarly large sums of money; and

Whereas, during the world war this dependence on foreign tonnage and this congestion at North Atlantic ports so overburdened our transportation system as to render it almost impossible to get troops and supplies to Europe, thus jeopardizing our chance of victory and our national safety; and

Whereas, these great lessons of the last decade have taught us the absolute necessity of an adequate and properly distributed American merchant marine, not only as a means of maintaining and extending our foreign market, but also as a measure of national defense; and

Whereas, the Jones Merchant Marine Act of 1920, passed almost unanimously by Congress, has certain provisions specifically intended to enable us to maintain a merchant marine in spite of foreign competition, namely, Sections 28 and 34, which provide respectively for preferential rail rates and preferential import duties on goods carried in American ships; and

Whereas, the Jones bill has also certain provisions, namely, Sections 7 and 8, specifically intended to prevent a recurrence of the congestion of 1919 and 1920 by providing for the establishment and maintenance of trade routes from the Gulf, South Atlantic and Pacific ports, as well as from the North Atlantic, to be operated by the government if necessary when at a temporary loss until the trades can be built up to such an extent that local companies can charter and subsequently buy the ships used on such routes, thus interesting a larger number of people financially in our merchant marine and thereby extending and developing the market for the ultimate sale of our government-owned tonnage; and

Whereas, it would be a very false economy, as well as a violation of the Jones bill, to attempt to save money by tying up ships to such an extent as to cripple or handicap in any way the development of these trade routes in particular, or of any adequate steamship service in general; and

Whereas, we feel that the carrying out by the government of these specific provisions of our existing Merchant Marine Act is the first necessary step for the establishment of an American merchant marine; and

Whereas, we feel that there can be no hope of a real development of an American merchant marine un-

less, as expressed by President Harding in his letter of September 20, 1921, to the National Merchant Marine Association, a national attitude of mind shall be developed and sustained in sympathy and understanding with the efforts of the government to establish such a merchant marine;

Therefore, we appeal to the President, to Congress and the United States Shipping Board:

First: To co-operate actively and wholeheartedly in carrying out Sections 28 and 34 of the Jones bill, so that we may no longer be subject to the danger of a repetition of the financial losses inflicted upon our producers and shippers in the Middle West, as a result of the excessive ocean freight rates caused by the withdrawal of foreign ships in 1914.

Second: To co-operate actively and wholeheartedly in carrying out Sections 7 and 8 of the Jones bill, providing for the establishment of trade routes from the Gulf, South Atlantic and Pacific ports, as well as the North Atlantic ports, so that the producers of the Middle West may no longer be forced to ship through the "neck of the bottle," at the North Atlantic, and may no longer be subject to the danger of a repetition of the financial losses inflicted upon them as a result of the congestion of 1919 and 1920.

Third: To co-operate actively and wholeheartedly in working out a plan whereby an adequate fleet of tramp steamers and an adequate number of tramp ship operators can be maintained in readiness to meet promptly the fluctuating demand for tonnage caused by the seasonal movement of many of our exports of largest volume, particularly our agricultural products, which are now in large part carried on foreign ships.

Fourth: To make an immediate and impartial study of our present laws affecting shipping and of the operation of our fleet under these laws, with a view to the repeal or amendment of any legislation that may be unduly hampering the development of our merchant marine, and with a view to the passage of such additional legislation as experience may prove to be necessary for the development of our merchant marine in competition with foreign fleets; and

Further, we appeal to our exporters and importers:

To co-operate in the establishment and maintenance of an American merchant marine by specifying that their shipments should, whenever possible, be carried on American ships; and in order to make this practicable we urge the representatives of the industries controlling the largest volume of our imports and exports to confer as once with the Shipping Board and to co-operate with the board in working out ways and means wherever necessary by which they can obtain as satisfactory rates and service from American ships as they can obtain from foreign ships; and

Further, we appeal to our bankers, particularly to those who are financing foreign shipments:

To co-operate in the establishment and maintenance of an American merchant marine by using their influence, in every legitimate way, on our exporters and importers, to persuade them to ship in American rather than in foreign bottoms; and

Finally, we appeal to the rest of the nation—to the Pacific, the Gulf, the South Atlantic and the North Atlantic states—and to the National Merchant Marine Association and to all other organizations interested directly or indirectly in the development of the Amer-

ican merchant marine, to co-operate with us of the Middle West in the carrying out of this program.

Additional Resolutions Adopted at the Cincinnati Meeting

Whereas, we of the Middle West have today drawn up and adopted a program which, we believe, if carried out, will help in the development of an American merchant marine; and

Whereas, we believe that it is vital to the interests of the Middle West and to the entire nation that this program should be carried through to completion;

Therefore be it resolved, That a special committee shall be appointed forthwith, whose duty it shall be to follow up the various matters covered by this program with the President, with Congress, and with the United States Shipping Board; with our exporters and importers; with our bankers; with the other parts of the country, and with the National Merchant Marine Association and all other organizations interested directly or indirectly in the American merchant marine; and that said committee shall have power to increase its membership and to determine its own procedure.

IMMIGRATION ON A PERCENTAGE BASIS

New Law Makes Puzzling Situation for Steamship Lines

IN the New York Times for October 2, Mr. Joseph Mayer, formerly acting chief of the Americanization Division of the Department of the Interior, has a very informative article on the situation developed by the enforcement of the new immigration law. The quotations from traffic managers cited by Mr. Mayer showed that this law is causing a very great deal of difficulty and producing many trying situations for everybody concerned. The immigrant, the government, and the steamship lines, particularly those operating on the North Atlantic, are all suffering acutely and are all getting to the breaking point over the confusion incident to questions of international law, the distinction between nationality and nativity, the classification of exempted aliens, such as tourists and professionals, and many other points upon which the law is not clear and upon which decisions are becoming increasingly difficult.

In those cases where the maximum quotas are small, such as Albania, Bulgaria, Danzig, Fiume, Luxemburg, Palestine, all of which are entitled to less than sixty a month, these difficulties are aggravated. When foreign nationals are traveling in a stream from dozens of ports and coming in at all ports on both coasts and at all points of both the Canadian and the Mexican border, it is easy to see how embarrassing situations multiply at a port like New York and how steamship companies, acting in perfect good faith both with their government and with their immigrant passengers, may be caught by circumstances over which they themselves have absolutely no control, and forced to deport shiploads of aliens.

The law, after a very vigorous discussion for months in Congress, was signed by the President on May 19 to go into effect on June 3. Thus the world was given two weeks in which to adjust international machinery to a new American policy. When on top of this hasty action the quotas for nationalities and the departmental regulations for enforcement were not officially announced until two days before the law became operative, the resultant confusion was so great that the Secretary of Labor, acting under Section 3 of the old immigration law, authorized the landing of all aliens arriving on steamers that had sailed from Europe prior to June 8. A bill was then passed in Congress permitting these aliens so admitted to be charged against the various quotas for the following fiscal year. The Department of Labor, charged with the enforcement of the law, had no machinery for control at the sources of immigration, and the State Department refused to utilize its consular visé system for the control of immigration abroad without special Congressional authority. So that the steamship lines them-

selves were forced to undertake the task of regulation in Europe. The trans-Atlantic passenger conferences arranged to have European offices of the co-operative lines cable advice on steamer sailing days, giving the numbers and nationalities of embarking aliens of all classes. This information was also furnished to the immigration commissioners of the various ports. These cable reports, corrected constantly by whatever government figures are available, have been issued regularly every few days and are being sent to all lines and to government officials, and cables of warning are dispatched by the conferences here to European clearing houses whenever the arrivals and sailings for any nationality approach 50 per cent of the monthly quota.

One difficulty with the system is that the numbers charged against the monthly quotas are based on actual admissions to America instead of actual departures from the source. The Department of Labor has declined to change the ruling in this regard, although it is clearly evident that the latter criterion would be the only basis by which all the lines through their clearing houses could so regulate their embarkation as to be able to prevent any excess of quotas reaching this side. The lines co-operating in the conferences could also be more readily controlled under such method, and it would be much easier to effect a system of quota apportionments among the various carriers by governmental control at the point of embarkation.

Where the present method is used of adjudging quotas by actual arrivals and admissions in American ports, storms, fogs, and other acts of God may set at naught the best laid plans of steamship operators. For instance, the Italian steamship Calabria, due to arrive on July 27, was delayed and reached New York on August 1, thus affecting the schedules and quotas for both July and August, and the June allotment for Portugal was upset by the unexpected arrival of two tramp schooners, one at Boston and the other at Providence, with almost enough Portuguese immigrants on board to fill the full quota for the month. One of these schooners had been at sea thirty-seven days and the other forty-three days.

Some of the non-conference lines have formed the habit of anchoring outside the three-mile limit and racing into quarantine a few minutes after midnight on the last day of the month. Any one of the ships thus handled might have the full quota of any one nationality for the full month and those on board the other vessels would have to be deported. Making the count solely with reference to the admissions on the American side creates complications resulting from competition between slow and fast liners, short and long routes, etc., and adds endlessly to the confusion

of the whole matter. Such situations could certainly be prevented by charging the aliens embarking against the quota for the month in which they embark.

In June the quotas for twenty-three out of thirty-seven nationality groups were exceeded by 11,741, while for the remaining fourteen groups the quotas were not reached by nearly an equal number. In July the efforts of the lines to create order in the business were commencing to tell, and the monthly quotas were exceeded for only eleven nationalities and for a total of only 623, while for the other twenty-six nationality groups the number brought in did not reach their quotas by 43,290, or nearly two-thirds of the entire quotas for the month. In August a still better showing was made when only seven nationalities exceeded their monthly quotas for a total of 3490, while the remaining thirty groups were 41,197 short.

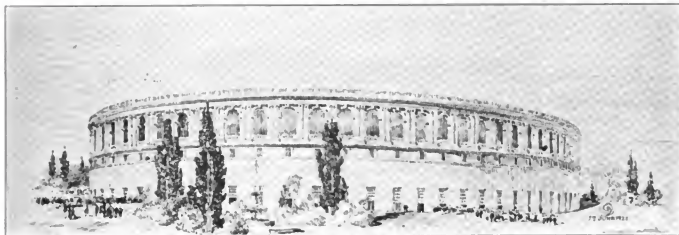
These figures were given out by the manager of the

Lloyd Sabaudo Line. If they are correct, they indicate that the steamship companies are making a very determined and earnest effort under great difficulties to clear up this extremely confusing situation, and they also indicate that there is very little need for the expressed impatience of Federal officials and the recent characterization by them of "dishonest steamship agents" and their impositions on government agents.

It seems to us largely a matter of that well known and very lamentable lack of co-operation between government departments. The State Department should be designated as the administrator of the immigration law and the count of quota should be at the source. The present method of administering this law is very much like locking the barn door after the horse has been stolen.

THE FLAGSHIP OF AMERICAN FOOTBALL

Great Memorial Structure at the University of California



Artist's drawing of memorial football stadium for the University of California at Berkeley

OVER at the University of California, greatest institution of its kind in the world, the Associated Students are building an immense ferro-concrete vessel. This structure is to serve both as a very fitting memorial to the university men lost during the war, and also as a training ship or carrier for the athletic activities of the university student body.

The plan is being financed by subscriptions mainly among the alumni and student body. These subscriptions are in units of \$100 on various terms, and each subscription entitles the subscriber to seats at games to the value of \$10 per year for ten years. The alumni and general subscribers are raising \$1,000,000, and the student body \$500,000. As we go to press these sums are practically guaranteed.

The specifications are: length over-all 728 feet, beam molded 528 feet, depth molded 90 feet. She is built on the two-deck principle of reinforced concrete and has a capacity for 60,000 rooters comfortably stowed on the steps of her ample sloping decks.

The berth for this immense barge has been acquired

through purchase of four blocks adjacent to the university property. This site is on the first slope of the Berkeley foothills, and the great seaward wall of the stadium, 728 feet long and 90 feet high, will be the most prominent landmark to greet the eye of the mariner coming in at the Golden Gate.

Dedicated to California's heroes who laid down their lives in the service of their country, housing the supreme efforts of friendly rivalry in America's great intercollegiate sport, facing the great gateway to the commerce of the Pacific—who shall measure the influences that this building on this site shall have in shaping the future of the American merchant marine?

Here every Saturday afternoon in the football season thousands of students, exultant in victory or sobered by defeat, shall turn to the west and behold the celestial artist paint a broad path of gold across the deep blue waters of the Pacific Ocean, an added laurel to the victor's crown, an emblem of hope for the morrow, and a constant enticement to entrance into the struggle for supremacy in that greater arena of commerce which lies beyond the Golden Gate.

FREE PORTS AND FREE ZONES FOR THE UNITED STATES

By HENRY M. ROBINSON,

President the First National Bank of Los Angeles and the Los Angeles Trust & Savings Bank

In this paper Henry M. Robinson, former member of the United States Shipping Board, develops a very interesting argument in favor of the present bill before Congress for the establishment of free zone districts in the principal ports of the United States.

The principle of free ports or free zones would seem to be almost axiomatic in the case of any nation following a protective tariff policy. It has been practiced in Europe for centuries and has come to be recognized as a necessity for that freedom in turn-around and trans-shipment which alone can build up the foreign shipping of any nation.

We have now in the United States recognition of the necessity for such districts in our laws governing the trans-shipment of goods in bond and the storage of such goods, duty free, in bonded warehouses. The free zone idea would, if adopted, extend the principle of the bonded warehouse, free from red tape restrictions, to certain districts in our ports and would make possible in those districts the ready re-distribution and manipulation of ships' cargoes for trans-shipment without hindrance by Custom officials.

THE surge of the trading nations of the world to re-establish their foreign commerce brings again to the fore a proposal which has frequently been discussed in this country—a proposal for the establishment of so-called "free ports" or "free zones in ports" in the United States.

Bearing on Foreign Trade

At the present, the subject is of much greater importance to this country than at any time in the ten years that the project has been under consideration—first, because of the bearing which the inauguration of such a policy must have on the maintenance of the foreign trade which the United States built up during the war; secondly, because of the fact that the United States now has a large merchant marine whose profitable operation, if not actual existence, is dependent on making the best use of our ports and trading facilities. Many proposals of tremendous beneficial potentialities are lost because not made at the proper juncture. Let us hope that this time the proposal is better synchronized.

There are, unfortunately, many misconceptions concerning free ports and the advantages of their establishment which have developed during discussions in recent years. What is really meant by a free port is a free zone within a port of entry—a segregated district where imported merchandise can be unloaded from ships, either stored, exhibited, broken up, repacked, assembled, distributed, sorted, refined, and graded, or cleaned and mixed with foreign or domestic merchandise and otherwise manipulated, which may be exported in its changed or new form without interference or charge made by the Customs authorities of the United States. However, if any part of such merchandise before or after being manipulated should move from the free zone into a domestic market, the customs duty must be paid.

Foreign Trade Zones Defined

Senator Jones, in his bill, has adopted the expression "foreign trade zones," which term much better describes the purposes and uses, and much better defines the proposal. These zones, as proposed, would be of limited area ranging from a few acres to possibly several hundred acres. They would have their own waterfront, wharves and warehouses. The goods entering these zones would be unloaded without the

regulations or delays of Custom House inspection; in fact, our Customs officials need have no knowledge or concern that the merchandise exists; and it could be kept within the foreign trade zone indefinitely since, within the meaning of the tariff law, technically it would not be within the Customs boundaries of the United States.

Heretofore, opposition to the establishment of foreign trade zones has seemed to center under two heads: first, that it meant some attack on the principles involved in a protective tariff policy, and, secondly, that some few ports, where foreign trade zones were to be established, would thereby acquire an advantage over other ports and also over the interior.

Tariff Policy Not Affected

It would appear that the fear of the protectionists that the establishment of foreign trade zones would be negative to some degree a protective tariff policy cannot fairly be sustained because, in practice, all merchandise coming through a foreign trade zone into the Customs territory of this country will pay the customs duty as at present; and only such merchandise imported into a foreign trade zone as is trans-shipped will escape the customs duty.

As a matter of fact, the principle that imported merchandise retained for trans-shipment and actually trans-shipped should not pay the customs duty is already recognized by law in the United States. Under certain provisions of our statutes, merchandise falling under this classification may be impounded in bonded warehouses, shipped in bond across the country for trans-shipment by water, or even trans-shipped in bond abroad. Furthermore, merchandise on which the customs duty has been paid may be manufactured in connection with domestic products, and when shipped abroad become entitled to a refund of the duties paid, provided the imported merchandise so attached or worked into the domestic commodity is, at time of shipment abroad, susceptible of identification.

While the principle is identical with the proper use of a foreign zone, the carrying on of foreign trade under these statutes has in a large way been a failure, owing to the cost in carrying charges and financing, and loss of time and inconvenience in the way of meeting the technical regulatory provisions.

We have acknowledged the underlying principle, but

have burdened the operation of trans-shipment so greatly that, broadly speaking, it is ineffective, and relatively inoperative. The foreign trade zone is the practical and economic basis for operation under the principle now on our statute books and already accepted.

Relation to Merchant Marine

It must be recognized that if we are to engage in foreign trade, if we are to maintain a merchant fleet and are to continue our protective tariff, the foreign trade zone is a necessity, and the higher the protective tariff, the greater need for a foreign trade zone.

Another widespread misconception has been that those ports where free zones were to be established would have some advantage over the rest of the country, especially the interior. This is not the case under the present proposal. Originally, the propaganda for foreign trade zones contemplated their establishment in about three ports on the Atlantic Coast, and one or two on the Pacific. The present discussion, however, provides for the establishment of foreign trade zones in each of our important ports of entry. This is a great stride in the right direction, for if all of the foreign trans-shipment were to be done in the ports of New York, Philadelphia and New Orleans on the East Coast, and in only one or two ports on the Pacific, the congestion of traffic to and from these ports would place an additional burden on rail terminals already overloaded, and would result in an uneconomic transportation into the back country of merchandise intended for domestic consumption.

Free Ports and Zones Differ

As regards the people of the interior who have felt that the plan would place the interior at a disadvantage compared with the rest of the country, it is only necessary to repeat that there is no such thing as "free ports" in the sense of competition with domestic production. In no country where a protective tariff exists are there any free ports, although in such countries there are free zones within ports, and there is a vast difference between these two things.

Of course London has the greatest consignment trans-shipment market in the world; but England needs neither free zones nor foreign trade zones, as she is a free trade nation and her regular ports have had all the privileges that would be imparted by the setting up of foreign trade zones. Germany, with a protective tariff before the war, developed several ports where the principle of foreign trade zones was extensively carried on. From 1882 Hamburg has maintained a district where merchandise from abroad could come in and be handled and manipulated, and even manufactured, without the payment of customs duty. This resulted in the creation of world trade with Hamburg as the center. One or two other German ports also maintained foreign trade zones.

Port of London Operations Detailed

Although the port of London does not maintain a foreign trade zone, as such, a tremendous foreign trade trans-shipment business has been built up owing to the fact that all merchandise has moved in and out free from customs duties and regulations, and still does, except for war measures. At London, as a result, a tremendous market has developed under which shipments of commodities from all over the world may be made on consignment. These commodities are held in London, financed to a large percentage of their value, and then marketed throughout the world in an orderly manner.

The general merchants receive consignments of rubber, American and Egyptian cotton, South American,

Australian and American wool, hemp, sugar, coffee and a hundred other commodities, and for nearly all of these commodities London's prices govern world prices and affect the sale value of the product of the smaller producer in other countries. In practice, the shipper is credited with, say 80 per cent of the present value, and merchandise held and marketed as possible, and the balance accounted for when sale is completed. This creates a center where prices are determined and stabilized. This, of course, is advantageous not only to the British trade, but to British industries as well.

There is every reason why the United States should put itself in a position to obtain the marked advantages that would come from such a consignment market, in the interest of industry, in the interest of trade, and last, but not least, in the interest of maintaining a merchant fleet.

Provisions of Jones Bill

The so-called Jones Bill (Senate Bill No. 2391), introduced by Senator Jones of Washington, and shortly to come up for open discussion, provides for the establishment, operation and maintenance of "foreign trade zones" in ports of entry in the United States. But one zone is authorized in any port of entry, except when the port of entry is located within the confines of more than one state, when a zone may be authorized in each state in the territory comprised in such port of entry. The Secretary of Commerce is authorized, in his discretion, to grant to public corporations the privilege of establishing such zones. ("Public corporations" are defined as a state, a legal subdivision thereof, or a municipality, or a lawfully authorized public agency of a state or municipality.)

When such privilege is granted and the zone set up, foreign and domestic merchandise of every description—except such as is prohibited by law—may be brought into this zone and there stored, exhibited, repacked, assembled, distributed, sorted, refined and otherwise manipulated without being subject to the Customs laws of the United States, except as otherwise provided in the Act; and such foreign merchandise may pass the boundary of such zone into the Customs territory in the original package, or after manipulation, only upon payment of the customs duty.

Under the terms of this Act, no duty is to be applied to merchandise delivered from ship to wharf within a foreign trade zone until some part or all of it moves out of such zone for domestic consumption, at which time it will pass through the Custom House and be subject to the regular duty.

Free Zones and World Trade

The maintenance of a merchant fleet is obviously predicated on world trade. It is therefore evident that a high protective tariff and world trade and the maintenance of a merchant fleet with the commercial accompaniments of such operations are inconsistent.

The experience of European nations shows conclusively that a modification of this inconsistency can be brought about without definite injury to the principle involved in a protective tariff if foreign trade zones, free from customs duties and regulations, are established.

In fact, if the feeling continues to grow that we should engage in world trade and maintain a merchant fleet as a necessary corollary, the high protective tariffs must, of necessity, be greatly modified, unless some method is devised that will permit a world trade in merchandise in and out of our important ports of entry, without the delays and expense attendant under our present methods for trans-shipment.

Would Limit Serious Delays

If it be true that the cost of operation of our merchant ships is to be greater than that of the important competing nations, because of higher wages and higher living standard for the men who go to sea, some method must be devised to balance that loss. The two great economic wastes in the shipping business are, voyage without adequate cargoes and loss of time in ports, and especially that loss due to delays resulting from the administration of complex laws and regulations—regulations which unfortunately lie within the province of many different governmental departments. It is recognized that the elimination of port delays would be of great economic advantage and that successful ship operation depends on keeping the ship at sea at the work for which it was built, and filled adequately with cargo.

A foreign trade zone, limiting, as it does, serious delays would permit the prompt unloading of the ship within the boundaries of the zone and later such part of the cargo that was intended for domestic consumption could move through the Custom House to its destination, as well as furnish additional cargo.

While it is to be recognized that ships other than those under our flag will have the same advantage in our ports, it is fair to assume that ships under our flag touch more often at our ports, in a given period of time, than the ships under other flags; and to that extent, at least, there would be a factor for improvement in the cost of the operation of American ships.

Another great advantage in the operation of our merchant marine ships would be that we would be in the same position as our competitors in the making of the so-called triangular voyages, and in the movement of cargoes to our ports where only a part of such cargo would be intended for consumption in our country.

Effects of Jones Bill

The problem of the American ships has been that while we have merchandise for export shipment, only too often it is necessary for the ships to return in ballast. On the other hand, the English, a Free Trade people, have been until recently able to fill their unoccupied space in their ships outward bound with coal for foreign countries and for bunkering (and this condition is again returning), returning with cargoes of commodities from foreign countries, partly for home consumption and partly for trans-shipment, and very often all under consignment for trans-shipment only, and trans-shipment made without any regulatory practices that result in delays and without our customs expense. This, too, was true in Germany because of the free port zones long since established.

Should the Jones bill become a law, our protection principles will be conserved; because, otherwise, if we engage in foreign trade in any large way, pressure will, in the course of time, result in a marked modification of the present protective tariff laws, all of which might be unnecessary or even obviated, if we could maintain our foreign trade and our merchant fleet through the medium of foreign trade zones.

Without Injury to Established Principles

It is to be recognized that the two groups who should be most interested in the establishment of foreign trade zones free from customs duties and regulations are the high protectionists and those engaged in foreign trade, including the ship owners and operators. It is to be recognized, too, that generally the views of these two groups are widely divergent. Nevertheless, the whole country and its domestic trade and industry and the financial element in each community have an indirect interest in the establishment of such machinery, without injury to any of our established principles, and actually for the benefit of all.

A GOOD USE FOR WOODEN STEAMERS

THE first of October has come and gone, and the wooden ship fleet of the United States Shipping Board is still afloat and unsold. We assume, therefore, that the United States Shipping Board will welcome suggestions for the use of these vessels.

We note with pleasure a suggestion made by our friend and correspondent, John L. Bogert, in the New York Tribune for October 5, that these ships be used for school purposes. Quoting Mr. Bogert's article:

"Not to mention their conversion into hospitals and homes, they certainly are worth the substantial part of their cost as schools. Equipped as they are with engines, boilers and propellers, they can be used to help every public school boy in our sea and river ports to understand the fundamentals of marine engineering, and equipped as they might be with machine tools, they would fill a long-felt want in supplying technical shop instruction to these same boys."

This use certainly, if applied very widely on the waterfronts of most of our seaports, would engage the services of the majority, if not all, of the wooden steamers and surely open up a very attractive perspective along educational lines for the adventure-loving youth of our coast states. In practically every

American city every fall season there is a more or less acute shortage of schoolroom space, and by co-operation with the school boards the Emergency Fleet Corporation no doubt could salvage a very large proportion of the cost of their wooden steamships. There is, as Mr. Bogert points out, plenty of precedent for the use of ships for school purposes and plenty of warrant for the assumption that such a use would take very well with the majority of the boys in our public schools.

It is futile and worse than useless to keep on hoping that these wooden steamers may be sold to advantage as commercial ships. They simply cannot compete with a steel steamer, much less with a motorship.

They can, however, be distributed among the ports of the United States and at the rate of from one to five in a port serve many useful purposes when moored along our waterfronts.

The Shipping Board, the Emergency Fleet Corporation, or whoever owns and cares for them, can easily afford to give them away to any municipality for public work service rather than keep them at a constant expense with no return.

HISTORY OF THE ANDREW JACKSON, MEDIUM CLIPPER SHIP

By F. C. MATTHEWS

High o'er the knight-heads flies the spray,
As we meet the shock of the plunging sea,
And my shoulder stiff to the wheel I lay,
As I answer "Aye, aye, sir, hard a lee!"

With the swerving leap of a startled steed,
The ship flies fast in the eye of the wind,
The dangerous shoals on the lee recede,
And the headland white we have left behind.

The topsails flutter, the jibs collapse,
And belly and tug at the groaning cleats;
The spanker slaps, and the mainsail flaps,
And thunders the order, "Tacks and sheets!"

'Mid the rattle of blocks and the tramp of the crew,
Hisses the rain of the rushing squall.
The sails are aback from clew to clew,
And now is the moment for "Mainsail haul!"

Aand the heavy yards, like a baby's toy,
By fifty strong arms are swiftly swung;
She holds her way, and I look with joy
For the first white spray o'er the bulwarks flung.

"Let go and haul!" 'tis the last command,
And the head-sails fill to the blast once more,
Astern and to leeward lies the land,
With its breakers white on the shingly shore.

From "Tacking Off Shore" by Walter Mitchell



SECOND of our series of articles on celebrated members of the world-famed California clipper fleet, this paper deals with the ship whose passages were more generally heralded and exploited as being "phenomenal" and "record-breaking" than were those of vessels honestly and actually entitled to such distinction.

The captain of the Andrew Jackson consistently refused press agents and others interested access to his log books, giving out for publication only broad and general statements, some of which were subsequently disproved by friends of rival ships. It may also be here stated that the name of the Jackson does not appear at all in Lieutenant Maury's "Sailing Directions," because, contrary to the custom of practically all other clipper captains, her master did not furnish data from his logs for incorporation in the lieutenant's book. The "Directions" contains log-book details of several thousand voyages over the various world-wide trade routes, made prior to 1859, and is authoritative and official.

Our present article will not attempt to detract from the merits of the Jackson, but will give her full credit for a series of exceedingly fast passages, fast even for a "McKay eighteen-knotter." Hard facts and figures obtained from unquestioned authorities will be found to refute the claim that she broke a record in any instance.

The Andrew Jackson made seven passages to San Francisco, Captain John E. Williams being in command for the first five. Captain Johnson took the ship toward the end of 1860, remaining in charge until she went under British ownership in 1863. The following is

an epitome of these voyages, details being given later:

San Francisco Passages

First voyage: Arrived at San Francisco November 20, 1855, 128 days from New York. Had a good run of 10 days hence to Mazatlan in December; thence proceeded to the port of Altata, where loaded logwood; had a fair passage thence to New York; reported, about 92 days.

Second voyage: Arrived at San Francisco February 28, 1857; had sailed from New York November 15, 1856; passage 105 days. Sailed hence June 26, 1857, with a cargo of California produce—barley, hides, wool, tallow, shells, etc., and "1 bbl. wheat." Arrived at New York September 22, 88 days passage.

Third voyage: Arrived at San Francisco April 27, 1858; had left New York January 16; passage 101 days. Sailed hence July 1; arrived at New York October 10; 101 days passage. Had the customary cargo of California produce, including "1388 blocks of California marble."

Fourth voyage: Arrived at San Francisco April 5, 1859; had sailed from New York December 23, 1858; passage 103 days. Sailed hence May 27 and arrived at New York August 22; 87 days passage.

Fifth voyage: Arrived at San Francisco March 24, 1860; had left New York December 25, 1859; passage 90 days 12 hours, anchor to anchor; 89 days 20 hours, pilot to pilot. Sailed hence April 26, 1860, in ballast for Callao; arrived out June 8; 43 days passage. Sailed from Callao in ballast June 20; arrived at New York August 22; 63 days passage.

Sixth voyage: Arrived at San Francisco May 4, 1861; had sailed from New York January 21; passage 103 days. Sailed hence July 31; arrived at New York November 9; 101 days passage.

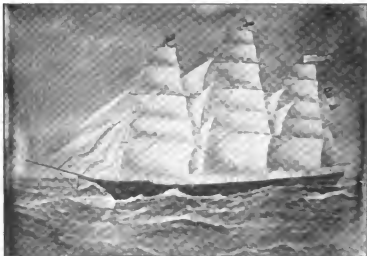


Photo by P. F. Watts from a painting at Sailors Snug Harbor
American medium clipper ship Andrew Jackson

Seventh voyage: Arrived at San Francisco May 21, 1862; had sailed from New York January 27; passage 114 days. Sailed hence July 10; loaded a cargo of spars at Puget Sound and sailed from Port Townsend about October 6. Arrived at Ferrol, Spain, January 12, 1863, claiming to have made the passage from Cape Flattery in 95 days. From Spain she crossed to New York, arriving April 11, 1863, after a boisterous passage of 25 days; had encountered thick weather with much ice and many icebergs on March 31 and been obliged to steer to southeast for twenty-four hours to get clear.

Sold to British

This voyage ended the career of the Andrew Jackson as an American ship, for on September 30, 1863, she left New York under the British flag bound for St. Johns. On March 2, 1865, she was reported as arriving off Dover from Soerabaya, Java, December 3, 1864, bound to Amsterdam.

Between her fifth and sixth Cape Horn voyages she is said to have made a round between New York and Liverpool, which would necessarily have been in the fall of 1860, and her last voyage under Captain Williams. Particulars of days and dates are not now available, but it has appeared in print that on her homeward passage she was 15 days from Rock Light to Sandy Hook.

Following are some details of her different voyages which are of interest:

Outward bound on her first voyage she lost a portion of her cutwater, had bulwarks stove, and sprung jibboom off the Horn. From 50 degrees south in the Pacific to within 700 miles of San Francisco her time was reported as having been 36 days; very good, but not a record.

On her second voyage it was claimed that she covered practically the whole distance from the equator to San Francisco in 16 days. While discharging cargo at Jackson street wharf she was fouled by the steamer Columbia, berthing on her arrival from Oregon, lost her jibboom, and had her bowsprit split. Her homeward run on this voyage was given as 85 days, but claims of sailing and arrival out show 88 days, as previously stated.

The outward bound time on the third voyage was the cause of considerable controversy and resultant newspaper correspondence. As originally claimed, the time was 99 days, or considerably under the run of the Twilight, Mystic-built medium clipper, of 101 days made about that time. However, when all necessary particulars had been obtained, it was found that the Jackson's passage was 100 days, 16½ hours, and the Twilight's 100 days, 20 hours, the time in both instances being computed from dropping New York pilot to passing Fort Point, San Francisco harbor. It developed, however, that Twilight was but 74 days from New York to the Pacific equator and was within 900 miles of San Francisco on her 88th day out, while Jackson had 81 days to the Line and exceptionally favorable winds thence, which retrieved her passage. Homeward bound this voyage the Jackson claimed to have crossed the Atlantic equator 70 days out and to have had 32 days thence to port.

Outward bound on her fourth voyage it was claimed that she was up with the Horn in 49 days and crossed the line 82 days out. Her homeward passage was represented as being 83 days only, but there is no question about the correctness of the dates previously quoted, and they show 87 days for the run.

Record Controversy

The outward passage, voyage five, was the cause of

much controversy. The time as first reported, 89 days, 7 hours, from New York, would have been a record and that made by a ship not of the clipper class, so that much interest was aroused. The Evening Bulletin of Saturday, March 24, 1860, had the following: "The Andrew Jackson—By the Eternal, she has made one of the quickest passages on record. At the moment of writing the time reported is equal to the best of the Flying Cloud's. When the days and hours are counted, we shall be happy to award the palm to one or the other. As the news reaches us at the moment of going to press, the Cloud must look to her long-worn laurels. (Then following in italics.) The ship Andrew Jackson to the consignment of DeWitt, Kittle and Company is telegraphed off the Heads, 89 days from New York."

The Daily Alta California of March 29 published the following letter:

"Editor Alta: I notice an article in your paper of the 25th inst. stating that the ship Andrew Jackson had arrived the day previous in 89 days 7 hours from New York, making the best passage on record and beating the quickest voyage of the Flying Cloud. I have waited patiently to the present time, hoping to see in your columns a detailed statement of this unprecedented voyage. Thus far I have been disappointed in my expectations and am still at a loss to know whether the reported time has been reckoned from anchorage to anchorage, pilot to pilot, or from the last sight of Sandy Hook to the first view of the Farallones.

"In the absence of such statement I now beg leave to claim for Captain J. P. Cressy and the ship Flying Cloud the credit for having made the best passage on record from New York to this port in the year 1854 in 89 days 8 hours, her anchor having been weighed at the foot of Maiden Lane at 12 m. January 21 and dropped in San Francisco harbor at 8 p. m. April 20, making the actual time, from anchorage to anchorage, 89 days 8 hours.

"In the absence of any proof to the contrary, I further claim that the passage of the ship Flying Cloud, Captain Cressy, from New York to this port in the year 1851 (her first voyage) in 89 days, 21 hours, is the second best passage on record.

"I have made no request to be permitted to look at the log of the Andrew Jackson, as I understand such favor has been refused to others. I have no personal acquaintance with Captain Williams, but judging from what I hear of that gentleman, I cannot believe that he would wish to appropriate to himself the honor awarded to him by your article, without having fairly earned it.

"Sorry as I should be to see my favorite beaten, still whenever it can be shown that it has been done, none will more readily extend congratulations to the victor than your obedient servant, E. F. S."

(Captain Josiah Perkins Cressy's name was pronounced Cressy, and he was familiarly known as Captain "Perk.")

Record Investigation

This letter caused investigation, with the result that the Alta of April 6, 1860, contained an elaborate half-column article giving the following details as furnished by Captain Williams:

Up anchor New York, 6 a. m. December 25, 1859; discharged pilot at noon. Received San Francisco pilot March 24, 1860, 8 a. m.; anchored in San Francisco Bay 6 p. m. Passage 90 days 12 hours, anchor to anchor; 89 days 20 hours, pilot to pilot. As the

Alta stated, "these figures and dates are facts and are unquestionably correct."

Spurious Claims

The writer of this present article has confirmed them from official sources, including the Board of Commissioners of Pilots of New York, and why in the face of this evidence the Jackson is still being given credit for not only equaling but even surpassing the record actually earned and held by the Flying Cloud is a matter of mystery. A recent elaborate publication, which shows considerable research into historical New England maritime matters, attempts to perpetuate the Jackson myth, in which case the compiler relies entirely upon unproven statements, while in the instance of the Dreadnought's 9 day 17 hour passage Sandy Hook to Cape Clear he decries as not authoritative the very methods he uses himself. There has appeared another version of this "record," wherein the time is given as 89 days 4 hours. This legend appears under the original of the picture we present, besides being the heading of a lengthy article appearing a short time since in a New York paper.

Another claim to "record time" on this particular passage of the Jackson was her 53 days from equator to equator, but this had been equalled in 1858 by her rival Twilight and beaten by the Young America in 1853 and probably by other clippers.

Completing her momentous fifth voyage, the Jackson was 43 days hence to Callao in ballast; sailed thence also in ballast June 20, 1860, and arrived at New York August 22, 63 days.

On her sixth voyage, the first under Captain Johnson, she had some fine runs—18½ days to the Line from Sandy Hook; 43 days to Straits of Le Maire; 52 days to 50 degrees south in Pacific; 78 days to the equator; thence light and variable winds and poor trades with much nothing in them forced the ship greatly to westward. In 29 degrees north she was in 137 west; was within 3 days' sail of San Francisco for 8 days, the whole passage occupying 103 days.

Tremendous Gale

When four days out from New York on her seventh voyage on the southern edge of the Gulf Stream, she experienced a severe northwesterly gale with a tremendous cross sea. While running before it shipped some very heavy seas which stove the wheelhouse, binacle, main-hatch house, skylights, cabin doors, etc., and started water tanks, spars, and everything movable about decks. Was hove to for 15 hours. Was 52 days to the Horn; was 20 days making the 20 degrees between 40 degrees and 20 south in the Pacific. From the Line to port had a good run of 16 days. The memorandum says that 20 miles outside the Farallones the ship passed through a large school of whales, the sea for miles around being alive with their spoutings.

As before stated, she completed this voyage by taking a cargo of spars from Puget Sound to Spain; thence went to New York, where she was sold, and as a British ship, under command of Captain McCallum, she went into the East India trade. She was lost December 4, 1868, in Gaspar Straits. At that time she hailed from Glasgow, her managing owner being H. L. Seligman. Had been opened and surveyed at Cardiff in 1867 and classed A-1½ for three years.

Specifications

The Andrew Jackson was built in 1855 at Mystic, Connecticut, by Irons & Grinnell; tonnage 1679, old measurement. She was 220 feet by 41-1/6 by 22-1/4; draft 21 feet. Her owners were John H. Brower & Company, New York, for whom the same builders had constructed the previous year the Harvey Birch

and who put the Racer on the stocks the following year, 1856.

These three vessels are the only ones listed among the California fleet of the '50's as being from the yard of Irons & Grinnell. All were described in "American Lloyd's Universal Register," the standard of classification of that period, as being of "medium" model as distinctive from the "full" carrier type, the "sharp" model and the "clipper" model.

Production of the extreme clipper type practically ceased in 1853, as the year 1854 showed less than half a dozen such models launched. We have nowhere seen a statement of the deadweight carrying capacity of the Andrew Jackson, but the Racer (which, by the way, was on the stocks four years, not being launched until 1860) was described as a miniature Jackson; was 833 tons register, old measurement, and carried 1600 tons California cargo. The Jackson is said to have had lines somewhat similar to those of the later well known Seminole, also from a Mystic yard.

The Andrew Jackson was a very strong and particularly well built ship, always delivering her cargo in first-class condition and being a favorite with shippers. Our picture, which is from an oil painting by Blacklow furnished through the courtesy of Governor Beckwith of Sailors Snug Harbor, shows a finely designed and well sparred vessel, not so lofty as the clippers and not carrying three skysails and royal-stun'sails, as has been variously stated. The figurehead of the ship was a full length statue of the soldier-statesman for whom she was named.

The seven passages of the Jackson from New York to San Francisco total 744.5 days, an average of 106½ days. The extreme clipper ship Flying Fish had an average of 105-6-7 days for her seven passages, while the Flying Cloud averaged 101 days 1 hour for her five direct passages. On her last passage here she was forced to put into Rio for repairs. Her net sailing time on the whole voyage being 113 days, gave her an average for six passages of 103 days.

It is noted that the "Clipper Ship Era" does not list the Andrew Jackson among the names of vessels making fast runs over any of the sections of the route under consideration, i. e., port to equator in Atlantic; St. Roque to 50 degrees south; 50 degrees to 50 degrees; 50 degrees south in Pacific; to the Line; Line to port. We have been unable to trace any record of the best hourly, daily or several-consecutive-days run of the Jackson, and it would appear that her rapid voyages were in at least some instances due to a continued succession of winds favorable to running near to direct course, rather than the ability to move through the water quickly. This is shown by the fact that the distance she covered in 90 days 12 hours was given as 13,700 miles, while the log of the Flying Cloud shows 15,091 miles made in 89 days 8 hours. Both Captain Cressy and Captain Williams had reputations for "carrying on," neither being more quick-witted than the other in this respect.

In conclusion it may be well to give here the four fastest passages from any Eastern port (and they happen to be all from New York) to San Francisco. They are:

Flying Cloud, Captain Josiah P. Cressy, 1854, 89 days 8 hours.

Flying Cloud, Captain Josiah P. Cressy, 1851, 89 days 21 hours.

Andrew Jackson, Captain John E. Williams, 1860, 90 days 12 hours.

Swordfish, Captain David S. Babcock, 1852, 90 days 16 hours.



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J. S. HINES
B. N. DEROCHÉ
A. J. DUFFELL
ANDREW FARRELL

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Business Manager
Editor
Associate Editor

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THE SHIPPING BOARD TASK

EVER since the armistice many of our esteemed contemporaries and we ourselves have been stressing the idea that in order to firmly establish the American merchant marine in foreign trade, shipmindedness was necessary for the American people. Now comes Albert Lasker, chairman of the Shipping Board, in an address delivered before the Advertising Clubs of America in convention assembled, which address is published in full as the leading article of this issue of Pacific Marine Review, and declares that it is necessary for "the miner in Arizona, the industrial worker in Indiana, and the farmer in Kansas to realize that the regularity and volume of their daily wage is in a measure as dependent on the establishment of an American merchant marine as is the continuity of employment and the wage of the dock worker in Baltimore or San Francisco" before there can be any "assured hope that the flag of the United States will be maintained as it should be on the seven seas."

Notwithstanding our former and present attitude on the necessity for shipmindedness among all classes of the American people, we cannot wholly agree with this statement of the chairman of the Shipping Board. In the article in this issue immediately following that of Mr. Lasker, an appeal is made by the Chambers of Commerce of the Middle West to the Shipping Board and the administration, which plainly shows that the business men, at any rate, of our great interior cities are alive to the necessity for an American merchant marine and to the reasons for that necessity. In fact, if anyone will read very carefully these two articles and will interpolate between the lines with understanding, he must be forced to the conclusion that it is very

possible that the workers of our great industrial centers will eventually have to pay quite a considerable bill for keeping the American merchant marine on the seven seas until such time as it shall be established in a normal, profitable way in the commercial trade routes of the world.

Going still further and reading the third article in this month's issue, we are face to face with the relationship between the establishment of America's merchant marine and the protective tariff policy which is now engaging so much of the attention of our lawmakers.

We have American industries and American agriculture largely protected by a tariff wall. We have American coastwise shipping protected by exclusive legislation. We need foreign markets for our surplus products. In order to get these foreign markets we must trade in the products of the foreigner. Our products must be taken to him and his brought to us on ships. The American problem with regard to the merchant marine consists simply in finding out what is necessary to be done in order that a respectable proportion of this carrying trade shall be done in American bottoms.

Undoubtedly the appeal from the Chambers of Commerce of the interior states, as cited above, sets forth several methods which will help to make this much to be desired object an accomplished fact. If any very large proportion of American shippers will in their placing of business give preference to American ships, it will help a very great deal. On the other hand, we cannot expect over any very long period of time that any American shipper is going to give preference to an American ship unless that ship can show equality in service and equality in rates with her foreign rival, and we know that under present conditions it is practically impossible for an American ship engaged in foreign trade to do this.

From the standpoint of cold-blooded business economics there may be room for a difference of opinion as to the advisability of American business paying the cost of maintenance of an American merchant marine. From the standpoint of naval and military strategy there can be no difference of opinion as to the advisability of the maintenance of an American merchant marine as an auxiliary to the army and navy. Therefore, it would seem to be logical that the Federal government—or, in other words, the people of the United States—should pay the difference in operating cost between American operation and foreign operation, operating cost as here used comprising all that is included in that term as computed on the books of the old established steamship companies.

If our memory serves us correctly, the original Shipping Board was created for the purpose of carrying out an investigation to determine just what was involved in such Federal government assistance to the American merchant marine. Our part in the great war intervened and postponed this original program for the Shipping Board, but now the war is over, and the Shipping Board has given into the care of the Emergency Fleet Corporation (from which it has divorced itself) the management of the great war-created fleet and the liquidation of the physical assets amassed by the expenditure of war funds, so that the Shipping Board should now be free to go on with the original program outlined for it by the act through which it was created. That should be the task to which Chairman Lasker and the other commissioners of the Shipping Board should be addressing themselves during the months that are to come, and the American

people should accede to the request of the chairman of the Shipping Board, giving him every co-operation and waiting with patience the results of his investigation of that problem.

It should be a comparatively easy matter and one involving a by no means prohibitive expense for the Shipping Board to audit the books of several of the more prominent American companies in the various trade routes of the world and of several of the foreign lines operating on the same trade routes and then, by a comparison between these audits and the books of the Shipping Board itself, come to a very definite conclusion as to the actual difference in operating expense.

It should also be a comparatively simple proposition for the Shipping Board to determine by a careful check of their own records and the records of other operating companies just what effect American rules, regulations and legislation affecting ships in foreign commerce have upon American operation as compared with the effect of, say, British or Japanese rules and regulations upon the operation of their respective ships in the same trade routes. Having made these audits and checks, it would again be a comparatively simple proposition to state the results in such a way that the remedies would become obvious.

That, it seems to us, is the duty and the whole duty of the Shipping Board.

To do that, no Congressional investigation committee is necessary, nor is it necessary to call busy men away from their ordinary tasks for long personal investigations at Washington. It is only necessary to get perfectly reliable auditors and responsible and efficient checkers. When this task is done and presented to Congress, the Shipping Board's preliminary task is finished and it is up to Congress and the people of the United States to apply the suggested remedy.

Let us hope that Chairman Lasker and his associates will be courageous enough to put over some such program quietly, in their own way without bombast, and that when their preliminary task is furnished and the results presented to Congress, that body will be wise enough to act upon those results without delay.

TRANSPORTATION PROBLEMS

THE great need in the world's commerce at the present time is adequate inland transportation. The supply of steamships is far more than ample to take care of all the freight offering, but in many of the world's greatest producing areas the railroad transportation is lamentably weak.

This is shown by a broad general survey of the great land areas of the world. There are in round numbers approximately three-quarters of a million miles of railway in the world. Over one-third of this length of railway is in the United States alone and a little less than one-third in Europe. On the great continent of Asia there are only 70,000 miles; in South America only 60,000; in Africa 30,000; and in Australia 26,000.

In the United States there are 89 miles of railroad for each 1000 miles of area; in Asia there are 4 miles for each 1000 miles of area; and in Africa 2½ miles. South America has but one transcontinental railway line, which is frequently blocked for several weeks at a time by winter storms. A second transcontinental line is now being constructed at a point very much nearer the equator.

Africa has no distinct transcontinental line, although a roundabout connection is possible for rail transportation across the southern part of that continent. The

long-talked-of Cape to Cairo line now operates about 4000 miles of railroad and 2000 miles of steamship line and requires about 650 miles of railroad to link up the two systems.

Eurasia, the great continent composed of Europe and Asia, has but one ocean-to-ocean line, the trans-Siberia, and that is largely inoperative through political disturbances. A second system now nearing completion would utilize the great European lines from points in Europe to Constantinople, thence by the Bagdad Railway to the mouth of the Euphrates, thence by steamer to Karachi for connection with the Indian railroad systems to Kumlong on the China frontier, from which point a line about 750 miles in length would connect that system with the head of navigation on the Yangtse-kiang. About 150 miles of line are necessary to complete the Constantinople to Bagdad railway.

In the meantime word comes from Australia that a transcontinental line from east to west has practically been completed, and a north to south transcontinental line connecting Darwin with Port Adelaide has been begun.

This railroad activity is all good business building for future expansion, and when the world settles down in dead earnest to the raising of its own bread and butter, there need be no fear but what with the assistance of these many rail feeders the ports of the world will be offering attractive freights for filling the capacious holds of the great merchant marine fleets, so much of which is now idle.

BUSINESS IS BUSINESS

"BUSINESS is Business," the Little Man said,
 "A battle where 'everything goes,'
 Where the only gospel is 'get ahead,'
 And never spare friends or foes;
 'Slay or be slain,' is the slogan cold,
 You must struggle and slash and tear,
 For Business is Business, a fight for gold,
 Where all that you do is fair!"

"BUSINESS is Business," the Big Man said,
 "A battle to make of earth,
 A place to yield us more wine and bread,
 More pleasure and joy and mirth;
 There are still some bandits and buccaneers
 Who are jungle-bred beasts of trade,
 But their number dwindles with passing years
 And dead is the code they made!"

"BUSINESS is Business," the Big Man said,
 "But it's something more, far more;
 For it makes sweet gardens of deserts dead,
 And cities it built now roar.
 Where once the deer and the grey wolf ran
 From the pioneer's swift advance;
 Business is Magic that toils for man;
 Business is True Romance.

"And those who make it a ruthless fight
 Have only themselves to blame
 If they feel no whit of the keen delight
 In playing the Bigger Game,
 The game that calls on the heart and head,
 The best of man's strength and nerve;
 "Business is Business," the Big Man said,
 "And that Business is to serve!"

Berton Braley in *The Nation's Business*

NEW RECORD FOR SAN FRANCISCO MINT

CONSIDERABLE attention is being directed in recent months to the record coining of silver dollars in the United States mint in San Francisco. Under the provisions of the Pittman Act an attempt was made to speed up silver dollar manufacture in all of the mints of the United States with the object of redeeming the interest-bearing treasury certificates and thus saving a considerable amount of monthly interest to the Federal government.

M. J. Kelly, superintendent of the San Francisco mint, and Samuel J. Ward, for years foreman of coiners in that institution, went very heartily at this task with the result that the production of the mint was speeded up to a point where it is turning out 260,000 silver dollars every twenty-four hours, an average of 1000 dollars per employe, which is much higher than that of any other coining plant in the country.

Since its establishment the United States mint in San Francisco has coined very close to \$3,000,000,000 in domestic and foreign coins. Its employes are known as the most skillful craftsmen of their kind in the country, and the majority of them have seen years of service.

A high tribute was recently paid to the mint here by Director Raymond D. Baker, who requisitioned the services of Samuel J. Ward to go to the parent mint at Philadelphia in order that he might "speed up things there in the San Francisco way."

PUBLIC BUILDINGS OR PUBLIC BREAD LINES?

"HARD times" is largely a state of mind. Therefore the statement recently issued by the U. S. Department of Labor to the effect that more than 5,000,000 men are now out of work in the United States need not of itself alarm. Rather it should spur us to immediate action in discovering the cause for this situation and in applying the remedy.

For five years or more the construction industry, recognized because of its far reaching ramifications as an index of prosperity or the reverse, has been confronted with repeated handicaps. This season has witnessed considerable private enterprise as recorded in the volume of business in dollars that has engaged the attention of the construction industry, but with the possible exception of highway work, public works have been notoriously inactive—this in the face of the oft repeated statement that there is a shortage of schools, hospitals, various municipal structures and buildings in general of a public and semi-public nature.

All of us can recall that months or years ago we voted a bond issue, or in other ways provided for the raising of funds to further some needed public improvement—a park development with its adjunct of recreation features, including perhaps a swimming and wading pool, a new city hall, new quarters for the fire department, a new hospital, new schools, or what not? The money for these is waiting somewhere to be spent. Often the spending has been held up by the misguided notions of our public officials that some time other than now would be more propitious for commencing the work. In the meantime the public—you and I—languish for the civic improvements which we thought had been provided for and were to proceed.

There has been a tedious period of readjustment, and latest indications point to an upward trend of prices. Some permanent new levels seem to have been

reached. This only reminds us again that delay profits nothing and is likely to be more costly if long continued.

One thing in particular makes the present unemployment situation somewhat alarming. The more or less confirmed habit of suspending construction activities with the approach of winter is certain to add to the ranks of unemployed. Even in the "normal times" of which we have been so wont to speak in recent months, suffering is with us in winter.

Bread lines are not in harmony with the present commanding status of America. We have more than half the gold in the world, a natural wealth untold, abundant harvests, banks bursting with money, inestimable resources undeveloped. If weather sharps are weather wise, a severe winter is approaching—cold supplemented by shortage of fuel and the inability of millions of unemployed to get the warmth of necessary food and other sustenance.

This isn't a cry of wolf, but a warning that human suffering and hardships may be inflicted upon the present unemployed as well as those who are about to join these ranks unless work and wages are obtainable. It is difficult to predict what may be the outcome of a situation such as that threatening.

Public work can be done more cheaply now than at any time in recent years, and the grave responsibility rests upon the shoulders of public officials to inaugurate and continue through the winter months every form of public work for which funds may be available as a means of preventing a social crisis which they may otherwise be required to meet. Action must be immediate. Politicians operating for political gain must forego that vocation and become plain public citizens and taxpayers, fostering only that individual interest which is the best interest of the community.

Let Chambers of Commerce, Rotary Clubs, Civic Organizations and all other similar public bodies resolve themselves into a citizenship committee of the whole, kick politics out of every open door and window and begin letting contracts for work at living wages. Competition of private enterprise is out of the way. There are men everywhere who want work, men everywhere who are willing to give a full day's labor for a full day's pay.

Let's all go to work building public buildings for public welfare! If we do, we'll not have to make bread for public bread lines.—Reprint from Engineering World.

FIFTEEN YEARS AGO

IN November, 1906, Pacific Marine Review, then three years old, recorded the results of the official standardization trials of the United States armored cruiser California, built in the Union Iron Works, San Francisco, which trials took place on October 5 in the Santa Barbara channel. The trials were highly satisfactory, the maximum speed attained being 22.75 knots, the maximum horsepower developed being about 30,000 indicated horsepower.

On November 12, in a four-hour endurance run held off San Francisco, the California maintained an average speed of 22.2 knots, steaming straight out to sea for two hours from a point just outside the San Francisco lightship, then turning at full speed and running back to the starting point.

Today we have afloat a larger, better, more modern California, also built on the shores of San Francisco Bay, and we have a greater, nobler and more mature state to stand sponsor for the ship.

UNEMPLOYMENT

THE above editorial from our esteemed contemporary emphasizes what we ourselves had to say in the October issue of Pacific Marine Review concerning the much discussed problem of what is to be done for the unemployed. Since writing the editorial for October on unemployment, the conference called by President Harding under the leadership of Herbert Hoover has been held, and its results have fully justified our forecast as then stated.

A committee of the conference nominated to look into the question of unemployment statistics reported back to the conference that it "deplored and was much impressed by the absence of adequate opportunity to obtain the essential facts concerning the matter of unemployment. Those departments of the government in Washington which deal with statistics in this connection are performing a most valuable work in that field but are handicapped by their inability to obtain comprehensive and well authenticated information from industry and commerce and by the lack of instrumentalities in many of the states and municipalities to gather and report such facts to a central governmental agency which could tabulate and present the actual status of employment and unemployment throughout the entire country."

This committee is of the opinion that the number of unemployed as of September 29, 1921, measured in terms of the reduction since January 20 in the number of workers on payrolls, exclusive of agricultural, is not less than 3,700,000 nor more than 4,000,000. We

have no means of knowing whether this estimate is correct or not, but we must assume that the figures are fairly accurate since the extreme variation is less than seven per cent.

One interesting fact brought out by the conference is that during 1921 up to September 1 there have been sold \$700,000,000 worth of municipal bonds, this eight months' balance exceeding the sum total of the twelve months of the preceding year, and that the sale of municipal bonds is increasing is evidenced by the fact that during August 333 municipalities had sold \$106,000,000 worth of municipal bonds. These figures indicate that municipalities are becoming increasingly active on the public works which have been delayed due to war conditions.

The reports brought in to the conference from the majority of industrial centers throughout the country show that in many lines of industry employing very large numbers of skilled and unskilled labor conditions of employment are slightly on the mend. This is particularly so in the case of the majority of the skilled trades, and it is for that reason that road work and other public improvements employing a large proportion of unskilled labor is being stressed and the municipal and state governments are being looked to for relief.

With just a little co-operation and intelligent effort directed to the immediate turning loose of municipal funds in construction work, America should be able to tide over the coming winter with no more than the usual amount of bread line experience.

THE ST. LOUIS WORLD TRADE CRUISE

The Past and Present of America's Foreign Trade

By J. HERBERT ANDERSON

President of the Anderson Overseas Corporation

IT is patent to any student of American business today that a large export trade is essential to the economic prosperity and social stability of the country, as our greatly increased resources of capital and labor can no longer look to domestic markets for full employment, but must reach out into the markets of the world. While there are thirty thousand manufacturing exporters in the United States, according to official statistics, not over one hundred and fifty manufacturers can rightly claim adequate representation in even all the major markets of the world.

This certainly is not because of the absence of American initiative; nor because American products are not equal in quality to any in the world; nor because of the inability of American manufacturers to visualize the need for foreign trade that the country may prosper and maintain its leadership among the nations of the world—a position it now temporarily holds; nor because of the unbelief in the minds of American manufacturers that the absence of foreign trade will result in unemployment in our industries, losses through great plants being shut down and general social unrest—the latter dangerous to the internal peace of the United States.

Export planning is based on the same hard common sense used in selling within the United States—no more and no less. It is a process easily understood, and in results profitable to the exporter and an aid to the commercial supremacy of the United States. It appeals to the cold blooded for its profit making possibilities, to the technician for its thoroughness, and to the man of vision because it brings into play all his business acumen.

Exporting to be beneficial to the individual or corporation, and to the United States, is selling the whole world, not one market at a time, which is a hit or miss method, mostly, and robs the exporter of the larger profits to be obtained by a world plan, which plan should be based on a knowledge of the world and its markets and a vision of a decade in advance.

Countless American manufacturers have ignored this basic foundation, resulting in many cases in disaster, and leaving very profitable fields open to European manufacturers.

What method, therefore, should be adopted by American manufacturers which will tend to re-establish, within the next two years, not only the export trade America had preceding the war, but make her present leadership a permanent one with balanced export sales?

The first step should be advanced planning for an ultimate world-wide and balanced trade, sufficiently complete so that no important market is overstocked and no minor market entirely neglected. To make such planning possible three necessary qualifications are: first, the visualizing of the product by the foreign buyer; second, the salesman who can sell; and third, an export manager who knows how to chart his territories and who will not make exclusive arrangements with agents except where agency representation is the logical sales treatment. Whether there is available for export a thousand dollars or a million dollars worth of merchandise, the rules mentioned above should govern.

These rules govern the plans we hope will be carried out in the World Trade Cruise of the St. Louis.

NUMBER ONE BROADWAY

The Home Port of the International Mercantile Marine Company



View of No. 1 Broadway from the Battery Park side

The International Mercantile Marine Company is an American holding corporation.

Its stock ownership is 94 per cent American.

It holds complete ownership of the entire stock issue of the following lines and companies:

American Line.
Atlantic Transport Line.
George Thompson and Company, Ltd.
Leyland Line.
Panama-Pacific Line.
Red Star Line.
White Star Line.
White Star-Dominion Line.

And a minority interest in:

Shaw, Savill and Albion Company, Ltd.
Holland-America Line.
New York Shipbuilding Corporation.

Its fleets comprise 120 ocean-going ships, including the Majestic, the largest liner in the world, and aggregating not less than 1,300,000 gross tons.

THE site of No. 1 Broadway is historically one of the most interesting in New York. It overlooks on the Broadway side the old market place and bowling green of the early settlers, and to the south the site of the first fort in New Amsterdam and the Battery. High lights in the chronology of this neighborhood are as follows:

- 1626—Peter Minuit, director general of the Nieuw Amsterdam settlement, bargained with the Indian owners of Manhattan in the clearing that is now Bowling Green, and bought the island for \$24.
- 1640—Peter Koeck, a sergeant in the Dutch garrison, built a tavern facing the bowling green, on the corner of Heere street, the site now covered by No. 1 Broadway.
- 1756—The site of No. 1 Broadway, having been owned successively by Frederick Phillipse and Abraham De Peyster, merchants and men of substance in New York, was purchased by Archibald Kennedy, a captain in the Royal Navy, who built thereon a spacious mansion.
- 1776—Captain Kennedy, who upheld the king, withdrew from New York and his home was occupied by General Israel Putnam of the American Army. Here for some weeks General George Washington came frequently from his headquarters at Richmond Hill to confer with his officers. Later the house was occupied in turn by Sir William Howe and Sir Henry Clinton, British commanders. It was from this house that Major Andre wrote the letters to Benedict

Arnold which preceded the American officer's betrayal of his trust and Andre's capture and execution.

- 1783—The Kennedy mansion was restored to its owner, who later sold it to Nathaniel Prime, one of New York's leading merchants and financiers.
- 1794—The Kennedy mansion became a house of public entertainment known as the Washington Hotel. As such at one time it housed Talleyrand, Napoleon's exiled minister.
- 1882—Cyrus W. Field, famous for laying the Atlantic cable, bought No. 1 Broadway and erected on the site a 12-story office structure, then the tallest in lower New York, known as the Washington building.
- 1919—No. 1 Broadway was bought by the International Mercantile Marine Company, and work of rebuilding the structure began.
- 1921—The rebuilding of the structure was completed, five floors being reserved for occupation by the American Line, the Atlantic Transport Line, the Leyland Line, the Panama-Pacific Line, the Red Star Line, the White Star Line and the White Star-Dominion Line, the constituent lines of the International Mercantile Marine Company, whose fleets, aggregating 120 vessels of 1,300,000 tons, ply to all parts of the world.

Reconstruction Problems

Technically the work of making over the building has presented a strong testimonial to the genius of American engineering and architectural deftness. The problem presented to the architect, Mr. Walter B.

Chambers, F. A. I. A., was no ordinary one. He was under the necessity of rebuilding the structure, outside and in, without dispossessing the tenants on seven floors. The company will occupy the first five floors of the completed building.

The task involved by sweeping structural alterations in the building called for many niceties of calculation and execution. The work included extensive strengthening of foundations in some places; the entire elimination of the heavy interior frame structure of the first floor, and the incorporation of the space in that floor into the upper portion of a lofty booking office; removal of roof and tower, and the construction of two new stories, in a different place; the relocating of staircases; change in the location for the main entrances to the building, and the introduction of entirely new ventilating, heating and electrical systems.

Decorative Motif

The finished product reveals a highly successful accomplishment, as the building presents today both in its exterior, now virtually completed, and in the work nearing completion within, a character and tone completely at variance with the old-fashioned red brick structure from which it has emerged. Heraldic shields of the world's chief ports let into the outer walls in Venetian mosaic of varied colors and gold are the principal decorative motif of the building's exterior. From the stone carvings around the shields spring bronze sockets, in which will be placed staffs for flags, with the Stars and Stripes over the main entrance and the distinguishing colors of the various lines of the company in minor positions.

Carvings, cunningly worked into the stone, suggest the uses to which the building is put. In the spandrels and pediment are shown Neptune, god of the ocean, and Mercury, god of trade.

Booking Hall and Offices

The distinguishing feature of the interior is the great booking office, extending the entire length of the Battery Park front of the building from Broadway to Greenwich street with a length of 160 feet, a breadth of 40 feet and ceiling 25 feet high.

This office is designed to represent the latest ideas in practical utility, with extensive counter space, a waiting room for customers, a department devoted to the issuing of traveler's checks, and a section for the distribution of travel information.



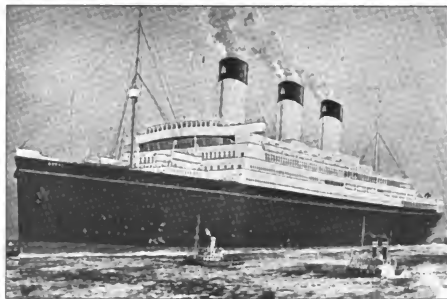
View of No. 1 Broadway looking across Bowling Green

One strikingly modern feature of the booking office will be a small motion picture theater for the projection of films portraying life on the company's ships when on the Atlantic passage or tropical cruises.

Four floors above the booking office will be occupied by executive offices of the company and its constituent lines, including a floor devoted to the accounting department, another to freight, another to operating, and the fifth to the general officers of the company and their clerical staffs, and the board room. On the Greenwich street level will be the third-class department, with extensive counter space, offices, waiting rooms, etc.

MAJESTIC

Owners—L. M. M. Company.
 Builders—Blohm and Voss.
 Gross tonnage—56,000.
 Length O. A.—955 feet 9 inches.
 Breadth molded—100 feet.
 Depth molded—70 feet 4½ inches.
 Loaded draft—38 feet 6 inches.
 Normal shaft h. p.—62,000.
 Average sea speed—23 knots.
 Maximum shaft h. p.—91,000.
 Maximum speed—26 knots.



PACIFIC COAST FISHERIES

Washington—III



OTALING a money value of more than \$10,000,000 in 1920, the state of Washington stands well toward the head of the list in the fishing industry of the nation. The most valuable Washington fishery is of course the salmon, but other fishery resources are enormous. The sturgeon, smelt, black, ling, rock and other varieties of cod, halibut, flounder, herring, mackerel, salt water perch, redsnapper, sand dab, shad, sole and many others are all found in commercial quantities, while oysters, crabs, clams and shrimps abound. The state is divided into four fishing districts, Puget Sound, Grays Harbor, Willapa Harbor and the Columbia River. With the first of these interesting international questions arise in competition with Canadian fisheries, while on the Columbia river controversies have arisen with the fisheries of the State of Oregon.

The most valuable salmon run that ever entered Puget Sound is the sockeye. In quality it is on a parity with the chinook, but in numbers it tremendously exceeded that famous species. The sockeye is the cause of most of the disputes with the fisheries of the Canadian Pacific Coast. These disputes remain to this day very live issues, for there has been pending before the United States for the last three years a treaty executed by the plenipotentiaries of Great Britain, acting for Canada, and the United States, which seeks to provide a program for the rehabilitation and perpetuation of this run, which has almost been exterminated by fishing. It may be pointed out that in 1913 on Puget Sound alone over 1,600,000 forty-eight-pound cases of this variety of fish were canned, while in 1921 it is questionable if the pack will be more than 75,000 cases.

The sockeye salmon are principally natives of a Canadian stream, the Fraser river. It is in the spawning grounds of the Fraser and its great tributaries that they are hatched and spend the first year of their existence. They then make their way down stream to the ocean to return at the end of the fourth year to the Fraser. On their return they first pass through American waters, and

American fishermen catch as a rule from three to four times as much as are secured by the fishermen on the Canadian side. Naturally this angers the Canadian fishermen, who feel that inasmuch as the fish are mostly produced by their stream they should be protected in the opportunity to secure a larger number. Americans, knowing they have the advantage, have been unwilling to concede any of it to the Canadians. The result has been that as negotiations, looking to a more equal distribution of the supply, have failed to be successful, on both sides of the line the efforts to capture the fish have multiplied, and the species is threatened with extinction.

On the Columbia river fishermen of Washington and Oregon have equal rights and a group of representative men from the two states hold regular meetings to make such rules and regulations as are deemed necessary for the industry.

Create Fisheries Board

The Washington state legislature at its last session created a state fisheries board, clothed with absolute power to say when, where and how fishing operations may be carried on in the state. L. H. Darwin, for many years state fish commissioner, becomes secretary of the board, and the other members include E. A. Sims, chairman, Captain Harry Ramwell and E. P. Blake. E. A. Seaborg is director of fish and game; J. W. Kinney, supervisor of game and game fish; and George A. Harris, chief deputy game warden.

Fishing Methods Numerous

The fishing industry in the state of Washington is carried on by practically every known method. This is shown very clearly by the variety of

licenses issued annually. In 1920 the number of licenses issued for the use of pound nets totaled 626; fish wheels, 27; set nets, 1024; gill nets, 929; drag seine, 184; purse seine, 345; reef net, 10; hook and line, 922; bag net, 126; drag bag net (smelt), 56; brush weir (herring), 5; beam trawl (shrimp), 14; clam digging, 774; clam digging for bait, 27; and crabs, 193. That the pound net and the purse seine are about equal in results obtained is shown by the fact that with 626 licenses issued for pound nets, a total of 1,444,601 pounds of salmon were obtained by this method of fishing; and with licenses given out for 345 purse seines, a total of 941,096 pounds of salmon were caught by this means. Although licenses were issued for 1024 set nets, the records show that only 101,536 pounds of salmon were taken.

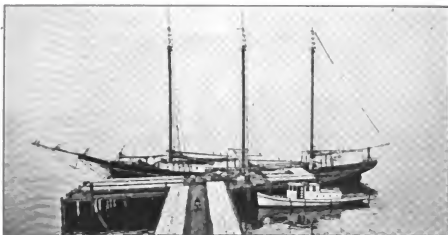
In 1903 the first gasoline-powered purse seine boat appeared on the Pacific Coast salmon fishing grounds



Typical Puget Sound cannery tender
Photo by Cobb



Part of the purse seine fleet of Puget Sound at anchor
Photo by Cobb



Fishing schooner Wawona of the Robinson Fisheries Company at Anacortes dock. Note codfish flakes drying on racks on deck. Photo by Cobb

in Puget Sound. The vessel was the Pioneer and was equipped with a 5-horsepower engine. The first season she easily demonstrated her vast superiority over the other purse seiners in the quickness with which, after a school of fish was sighted, she could reach it and surround it with her seine. The next year there were a few more power boats built or equipped, and the number has steadily increased until at the present time practically all seine boats are equipped with motor engines. The first power seine boats were only about 30 feet in length and had small power. As they were few in numbers, there was virtually no competition and high power and speed were not a necessity. As the boats increased in numbers, however, competition became keener and the first types of boats with their small power were quickly thrown into the discard by the newer types, which average between 45 and 55 feet in length, with 45 to 75 horsepower engines.

The Puget Sound purse seiners meet the salmon off the entrance to the Strait of San Juan de Fuca and follow the sockeye until they have passed out of American waters, what are known as the Salmon Banks, off the lower end of San Juan Island, being the principal rendezvous of the sockeye run. After this run is over they go up the Sound and fish for chums and cohos, and later go to the head of the Sound and fish for chums, cohos, chinooks and steelhead trout.

Each year the catching of salmon by trolling and trawling becomes of increasing importance commercially. These methods of operation were explained in the September issue of Pacific Marine Review in the article on California Fisheries, and for that reason will not be dwelt on here.



Pulling in cod with a handline over the rail. Photo by Cobb

Salmon First Importance

As stated before, the most valuable fishery resource of Washington is the salmon. As on other bodies of water on the Pacific Coast frequented by salmon, the Indians were fishing for them when the first whites visited the country. The natives at this time and for many years after used reef nets and hooks and lines in the salt water, and spears, dip nets and weirs in the rivers. For many years this region was comparatively isolated from the rest of the world, and the completion of transcontinental railroads has not completely changed this, owing to distance from large consuming centers. As a result of this isolation, it was necessary for many years to resort to methods of preparation which would insure the preservation of the product for indefinite periods. Salting naturally came first, followed by canning, while the shipping of fresh salmon has been steadily growing in importance as transportation facilities increased. During recent years the canning of salmon eggs for use as bait has come to be a side-line industry of considerable proportions.

The first salmon cannery on Puget Sound was erected by Jackson, Myers & Company, in 1877, at Mukilteo, in Snohomish county. The members of this firm had all been engaged previously in salmon canning on the Columbia river. The first pack was of 5000 cases, composed wholly of silver, or coho, salmon. Later at this plant were put up the first humpbacks ever canned. In order to divert the minds of purchasers from the fact that the meat of the humpback was much lighter in color than the grades then known to the



Dressing gang on a halibut schooner

Photo by Cobb

consuming public, the company printed on its label the legend, "Warranted not to turn red in the can." Even with this shrewd slogan, the demand for humpback, or pink, salmon developed very slowly and it was some years before it became a factor in the markets.

The Quinault river, which enters the ocean in the northwestern part of Grays Harbor county, has a length from the ocean to Lake Quinault of about 40 miles, wholly within the boundaries of the Quinault Indian reservation. This stream is especially noted for its long continued annual run of Quinault salmon. These fish, which are noted for their especially red colored flesh, make an appearance early in December, when the Indians generally catch them for their own use, as they fear that if the whites got hold of the fish they might throw away the hearts. Should a heart be eaten at this time by a dog or chicken, the Indians believe the run would not come. In January, when the fish begin to be abundant, all danger of this seems to have passed, for the Indians then usually have a considerable number for sale and these are shipped to distant markets in a fresh condition or are sold to the canneries. The big year of the Quinaults, in 1915, saw 350,000 of these famous salmon canned. Like the sockeye, however, the run is now much reduced. The silver salmon, the chum, the chinooks and the steelhead trout appear in the Quinault river during the fall and winter months.

During the Quinault season stake nets are used, while the rest of the time, as a result of the freshets, drift gill nets are used in the eddies. The stake nets are arranged in a rather peculiar manner. A line of stakes is run out for about one-third the width at right angles to



Humpback salmon jumping falls
Photo by Cobb

the shore, and to these are attached a net by short ropes. From each stake a section of net is run out and downstream, curving inward like a hook at the end, the latter part being held in place by three stakes. The stake nets are 40 to 60 meshes deep, with $5\frac{1}{4}$ -inch stretch mesh and are set 85 yards apart. A set of these forms one fishing location.

In 1883 B. A. Seaborg, father of E. A. Seaborg, present director of fish and game, established the first cannery on Grays Harbor. His plant was on the waterfront of what is now Aberdeen, although at that time it was practically a wilderness. In fact, it was from this cannery that Aberdeen received its name.

Washington has thirty-one state salmon hatcheries and eight trout

hatcheries. The federal government has seven hatcheries in the state and there are several county hatcheries, aside from ten privately owned and operated game fish hatcheries. To the increased efforts in propagation is due the increased taking of chinooks, silversides and chums. These runs have been but little diminished, while in some cases it is claimed by the state fisheries board that they have been actually increased. Transplanting salmon runs from one stream to another had never been attempted, at least on a large scale, until the state fish commissioner began it eight years ago. It was demonstrated by actual experience that eyed salmon eggs can be taken from one stream, conveyed to another stream, hatched out and liberated and the mature salmon will return to the stream where hatched out and liberated rather than to the stream where the eggs were taken.

Handle 16,000,000 Pounds Halibut

The Puget Sound halibut fleet during 1920 handled through Seattle a total of 16,174,199 pounds of fish which brought an average price of .172 cents per pound, making the total commercial value of the catch \$2,781,962.23. While this is an increase over 1919 and 1918, the condition is not as healthy as the figures indicate. The catch is far from proportionate to the increase in the fleets operating, and it has been necessary to widely extend the range covered and to increase the amount of gear used.

Today the sailing vessel is unknown in the halibut fishery, having been superseded by vessels with twice the carrying capacity of those formerly engaged, the increase in size permitting them to carry double the number of fishermen and dories. These vessels are all powered with gas engines. Instead of getting its catch within easy radius of Seattle, the fleet now fishes mainly on the Alaska off-shore banks, ranging from 800 to 2000 nautical miles from Seattle. A large number of small vessels, mostly of the purse-seine type, have been fitted up for long lining and operate with the fleet principally on the nearer banks.

The present extensive halibut fisheries of the Pacific owe their inception to the publication in 1886 of a series of very optimistic letters in the Cape Ann Advertiser, of Gloucester, Massachusetts. The enterprising spirit of the New England fishermen prompted them to consider the matter favorably, particularly as they knew from reliable sources that halibut were abundant off Cape Flat-



Purse seining on Puget Sound

Photo by Cobb

tery at certain seasons. The native fishermen had fished here for their own use for many years, the surplus being sold to the whites living on the shores of Puget Sound.

The pelagic fur-seal fishery, which was then lawful and quite profitable, was another strong inducement for the Eastern fishermen to make the venture of sailing "around the Horn," for some believed that this offered unusual opportunities for financial success, while they thought the period between sealing seasons might be profitably utilized by engaging in halibut fishing. The men who entered upon this experiment were among the most skillful, daring and adventurous of their class.

Eastern Schooners in 1887

In the fall and early winter of 1887, three schooners sailed from Massachusetts for Puget Sound. These were the Mollie Adams and the Edward E. Webster of Gloucester and the Oscar and Hattie of Swampscott. The two former were owned by Captain Sol Jacobs, who had achieved fame as a mackerel fisherman and who after dispatching his vessels crossed the continent in time to make the necessary business arrangements, pending their arrival. The Mollie Adams made a good passage and reached her destination without mishap, but the Webster met with an accident to her spars before rounding the Horn, put into Montevideo for repairs, was delayed and finally arrived on the west coast late in the season.

The Oscar and Hattie reached Puget Sound later than the Adams, but in time to engage in the halibut fishery, carrying six dories and a crew of fourteen men. About two-thirds of its catch was sold fresh and the remainder was fletched. The result of the season's work was 240,000 pounds of fresh and fletched fish, with a value at the prices paid



The Point Roberts cannery of the Alaska Packers' Association Photo by Cobb

the fishermen of \$7600. The fish shipped east by the Oscar and Hattie was the first shipment so made and it went forward by the Northern Pacific Railroad. The ice used cost \$22.50 per ton and the high freight rates took all the profit.

When the Mollie Adams returned to Puget Sound at the close of the fishing season she brought with her 150,000 pounds of halibut. In the meantime after a lot of trouble her owner, Captain Jacobs, had arranged for a rate of \$1.25 per hundred pounds for transportation of the fish across the continent to Gloucester. After deducting expenses the members of the crew received \$175 each, or at the rate of \$9 a day for 19 days' fishing.

Cod Fishery Large

Codfish handled by the Puget Sound fleet last year, fresh, cured and tongues, had an aggregate commercial value of \$359,061.93. Unlike the vessels used in the New England fisheries, there is no distinctive type employed in the Pacific cod fishery. Many of them were at one time brigs, barks, barkentines and schooners employed in the carrying trade of the Pacific and purchased for use

in the cod fishery after they had attained varying ages. As the schooner rig has proven the most economical, many of the vessels have been altered to this type. They vary in length from 102 feet 6 inches to 156 feet, and the net tonnage ranges from 138 to 413.

All Pacific codfishing is done in the daytime. Early in the morning the dories are put over the sides of the vessel which has been anchored in a favored spot. Each dory is equipped with the necessary fishing lines, a small sail, a water beaker, a windlass for hauling in the anchor, a 10 or 14 pound anchor, a small keg buoy, a knife for cutting bait and bleeding the fish, a gaff for handling the large fish and with which most of the fishermen stun or kill the fish by striking it on the head with the handle. But one man goes in a dory and each rows away in search of a good place to fish. The direction in which they row from the vessel is to a great extent governed by the tide and force of the wind, the idea being to utilize the wind and tide to help in getting back to the ship when the dory, being full, would make rowing laborious.

Captain Matthew Turner, master of the brig Timandra, 120 tons, sailing from San Francisco in 1857, seems to have been the pioneer in the discovery of the commercial possibilities of the great cod banks of the Pacific Ocean. While his vessel lay anchored in northern waters waiting for the ice to break to make a river trip with an assorted cargo, the crew began fishing over the rail with hand lines simply as a pastime. They were surprised to find plenty of cod, averaging about two feet in length. Captain Turner had not previously seen codfish, but some of the crew were familiar with the species, and he, knowing their market value,



A Puget Sound cannery tender caught in the ice on Bering Sea

appreciated the importance of the discovery and became interested in the fishing. For several years he had no competition in this new line of commercial cod fishing, but in 1865 six vessels sailed from San Francisco to the Okhotsk Sea in pursuit of cod. These were the first American vessels to visit that region on cod fishing trips and their sailing evidenced a resolution to begin the business upon a broad commercial basis.

Shell Fish Industry

Clams, mussels and crabs off the coast of Washington and on Puget Sound furnish a big industry in themselves. During the year 1920 nearly four and a half million clams and mussels were taken and more than a million crabs were caught. Of the clams the razor variety taken on Grays Harbor is probably the

best known and the 1920 yield from this district alone totaled 3,040,758, for which the diggers received \$76,018.95. During the 1920 season ten canneries were operated on the Washington coast and the clam pack had a total commercial value of \$394,688.90. In addition to this 1082 cases of clam nectar were obtained with a value of \$2164. Handled fresh the clams for the season amounted to 666,920 pounds with a commercial value of \$23,951.53. The season's catch of crabs resulted in 1,656,933 being shipped fresh and twelve cases of crab meat were canned with a total value of \$432.

Aquatic Animals Taken

Grays Harbor has the only whaling station on the Washington coast, and from it three vessels are operated, the Westport, Moran and Aberdeen. During 1920 a total of 187

whales were captured, from which 251,733 gallons of whale oil were obtained, 49,493 gallons of sperm oil, 330 tons of fertilizer and 221 tons of whalebone. The year 1921 has been a quiet one in the whaling industry of Washington. When the season opened in April the market for oil was poor, and when relief in this line was obtained the shipping strike was called and all plans for operations had to be cancelled. Consequently the fleet of whalers has been tied up all summer.

The Universal By-Products Company, which established a tannery to handle skins of aquatic animals at Edmonds, Washington, has tanned more than 16,000 shark skins of various sizes and several tons of whale stomach and intestines.

A COLLEGE OF FISHERIES

The University of Washington Operates a Unique Department for the Study of Commercial Fishing

A College of Fisheries was established two years ago at the University of Washington, Seattle. It is the only institution of its kind in the United States and is one of two in the world, Japan being the only other country to have taken this step in advanced education. The American school has enrolled pupils from practically every nation, both European and Asiatic. Many graduates from the Japanese college have sought admission, feeling that the methods taught in their country might well be supplemented by the modern four-year course of the College of Fisheries at Seattle.

John N. Cobb, professor of fisheries, is director of the college, and many of the textbooks used are from his pen. His many years of earnest study and practical experience make him one of the best informed men in the United States on the commercial fisheries of the nation. The college now occupies buildings vacated by the Naval Training Station at the close of the war, but the university plans a permanent group of buildings as soon as necessary funds are available.

The College of Fisheries has a two-fold purpose: first, to afford instruction in the principles and practices of commercial fishing; second, to promote the interest of fisheries in the state of Washington and in the United States by encouraging the right use of fishery resources.



Professor John N. Cobb, director College of Fisheries, University of Washington, Seattle.
Photo by Hamilton, Seattle

The location of the college on the shores of Lake Washington and Lake Union, which bodies of water are connected by canals with each other and with Puget Sound, presents unrivaled opportunities for the study of aquatic life and fish culture and for experiments in the practice of fishing.

The ichthyological laboratory contains an extensive collection of fishes and is particularly rich in species from Puget Sound and Alaska. The laboratory for fish diseases is equipped for the study of

life histories of the various fish parasites. It includes aquaria for live subjects and a dark room for studying the effect of various colored lights.

A laboratory devoted to the study of apparatus is equipped with working models of the larger forms and fully rigged types of the smaller forms of fishery equipment. Practical instruction is given on the manufacture, use, care and repair of all classes of fishing gear. The canning laboratory contains all the machinery and appliances necessary for canning any fish product, and much experimental and research work is done. The curing laboratory is equipped for the pickling, dry-salting, mild curing and smoking processes.

About 700 square feet in Fisheries Hall No. 2 is occupied by a fish hatchery, which is furnished with troughs, baskets and other essentials for the care of 500,000 salmon or trout eggs. A complete set of batteries of open and closed-top jars is provided for the care of several million semi-buoyant eggs. Cement lined ponds are available in the college grounds for the rearing of various species of aquatic animals. Trap-netting, purse and haul seining, gill netting, trolling, hand and long line fishing, oyster gathering, clam digging, kelp harvesting, and other forms of commercial fishing are every-day work for the students.

THE AUXILIARY STEAMER VICTORIA

An Account of a Successful Combination Steam and Sail Ship

By JOHN L. BOGERT

THE Victoria was built in 1852 for the England-Australia trade. She was a combined sailing and steaming ship, what we call today an auxiliary. Taking into consideration the limitations that at that time surrounded steam engineering, she was a great success. She was given a fine model (that was the day of the clipper ship) because she was expected to maintain a sea speed of 10 knots under steam alone and without steam to keep up with the fast sailing ships of that time. Through a combination of circumstances connected with the discovery of gold, the price of coal had risen to £5 per ton, and it is not at all impossible that the day may again dawn when fuel will be expensive and man will once more turn to the winds for help.

The Australian authorities had offered a prize for the most rapid passage under steam from England to Australia, and this prize was carried off by this little "auxiliary" when she left Gravesend on the 18th of one June and reached Adelaide on the 19th of the following August. On one trip the Victoria ran this same distance in 59 days, 22½ hours, including two days' stoppage at St. Vincent's, the fuel consumption for the voyage being 1200 tons.

Oscillating Engine

Her engine would have given the modern sea engineer the nightmare, being a four-cylinder angular oscillating steam engine with cylinders of 48-inch bore and 33-inch stroke. The steam pressure was but 15 pounds per square inch; that meant box boilers, and a fuel consumption not lower than 3 pounds per indicated horsepower hour. Of course there was jet condensation with constant blowing down and replenishing of the water in the boilers with seawater. Her engine turned a two-blade propeller, 15-foot diameter and 22-foot pitch, at 60 r. p. m. full power. If her engine and boilers and condensers were economic crimes from our present standards, afloat her engine she was way ahead of any modern auxiliary, and it is that superiority which justifies the writing and publishing of this article.

Line Shaft Clutch

Aft of her engine was a powerful clutch that transmitted the power of the engine to the propeller shaft. That clutch was highly satisfactory in every respect, permitting the clutching and unclutching of the propeller and engine in half a minute by one man. For more than ten years this clutch successfully answered to every demand of perpetual clutching and unclutching in all kinds of weather, transmitting over 1000 I. H. P. The propeller was of large diameter and coarse pitch

Recently the La France, the largest sailing ship in the world, which had been equipped as an auxiliary with twin Carvels-Schneider Diesel engines, has been reconverted into a plain sailing ship. The question naturally arises in the minds of the marine engineer and naval architect: why was not the Diesel engine left in and the masts and sails taken out?

The La France is of about the same deadweight tonnage as those two successful motorships, the Selandia and the Jutlandia. The La France had two 900 B. H. P. two-cycle Diesels; the Selandia two 1050 B. H. P. four-cycle Diesels. Is the La France as a sailing ship under present working conditions going to prove more economical than these two famous Burmeister & Wain motorships?

Mr. John L. Bogert, consulting engineer of New York, has had a very wide experience with Diesel motorships. He is going thoroughly into the matter of auxiliary powered sailing ships and believes an auxiliary can be built which on certain routes will surpass in economy even the motorship. Those of our readers who are interested in sailing ship operation will find this article very interesting reading in connection with an article along similar lines on "American Sailing Vessels," by C. O. Liljegen, which was published in Pacific Marine Review for February, 1920.

which was the reason why it did not interfere with the ship's sailing when unclutched. These two features were responsible for the ship's success. Brunel, the engineering genius responsible for the Great Western and Great Eastern, was the engineer responsible for the Victoria, and under his auspices a series of trials was carried out. Here are the results which no modern auxiliary can duplicate or even approach:

Results of Trial

1. Under steam alone, at full steam power, a speed of 11.66 knots was maintained on a fuel consumption of 1 ton, 10 cwt. per hour. The sea was smooth and calm. No indicator cards are available, but at 3 pounds per I. H. P. the above fuel consumption would appear to point to about 1120 I. H. P. It is a pretty

safe bet that those engines and boilers could not do better than 3 pounds per I. H. P. hour.

2. Under full steam and canvas, wind strong, a speed of 13 knots was attained.

3. Under sail alone, disconnecting the screw, so as to allow the ship to run freely under canvas, the wind free, moderate and light, all plain sails set, a speed of 8½ knots was averaged, passing easily three sailing vessels on the same course.

4. Under sail alone, with the screw disconnected, "by the wind," the ship made 5½ knots: stood well on both tacks.

5. Under sail alone, the wind free, light and moderate, the screw was stopped hard and fast in an upright position (behind the stern post). The speed fell to 5½ knots and the ship refused to obey the helm. When the screw was disconnected the ship's speed rose to 7½ knots.

6. Disconnecting the screw, so as to allow the ship to run freely under canvas, one man disconnected the screw while the engines were turning over in less than 30 seconds; one man reconnected the screw in 30 seconds.

7. The screw revolving by steam, the ship answered her helm quickly and perfectly. The engine being stopped and the vessel being under sail only, the screw being disconnected, the ship answered her helm as quickly and perfectly under sail alone as under steam. The screw being connected and placed upright hard and fast in front of the rudder, the ship ceased to obey the helm. The screw being connected and placed hard and fast athwartships, the ship answered the helm, but not so well as when disconnected. In all cases, the screw being fixed hard and fast diminished the speed about 2 knots and diminished the power of steerage. And in every case, the screw being disconnected and permitted to revolve freely, the steerage and speed were immediately restored; the operation in no case required more than 30 seconds.

The practical conclusions drawn from these experiments were as follows:

1. The power of sailing and quickly disconnecting the screw without stopping the ship or engines, as effected by the Victoria, is of great value to screw-steamships.

2. That the steerage of a ship may be injuriously affected when, either through ignorance or the lack of proper means, the screw is not disconnected while the engines are not at work.

3. That when the screw of the Victoria is disconnected and runs freely, neither the steerage nor speed

of the ship appears to be sensibly affected.

4. That the Victoria answered her helm and performed her functions equally well, under sail alone, as under steam alone.

The following are the principal dimensions and characteristics of the Victoria:

Length of loadwater line.....	261'
Beam extreme.....	38'
Depth at the side.....	27' 8"
Gross registered tonnage, tons.....	1350
Net registered tonnage, tons.....	1150
Drift light.....	10' 6"
Laden.....	17' 5' 6"
Area midship section light.....	330 sq. ft.
Laden.....	590 sq. ft.
Area lgt. water line plane.....	6970 sq. ft.
Laden.....	7600 sq. ft.
Wetted surface light.....	9947 sq. ft.
Laden.....	12,694 sq. ft.
Displacement light.....	1567 tons
Laden.....	3000 tons
Masts.....	4
Canvas in sails.....	13,860 sq. ft.
Weight of iron in hull.....	800 tons

On the basis of the foregoing figures, the admiralty coefficient of the Victoria figures out closely 295 when the ship, displacing 3000 tons, attained a sea speed of 11.66 knots per hour on an hourly consumption of 3360 pounds of coal, indicating 1120 l. H. P.

Feathering Screws

It seems singular that no auxiliary has been fitted with feathering screws—similar to the Bevis feathering screw-propeller. More than 2500 H. P. has been transmitted through one of these wheels, and they have uniformly given satisfaction to the ship-owner.

The pitch of propellers fitted to oil engines is usually 9/10 of the diameter, and sometimes even less. A pitch of 9/10 of the diameter means a blade angle at the tip of 16 degrees with a thwartships plane, and a blade angle of but 22 degrees at its center of area. It would be quite hopeless to expect a propeller with blades having such thwartships angles to turn freely when disconnected from the engine, under the action of the ship moving through the water propelled by her canvas alone. In fact the drag that results from such fine pitch propellers has been measured, and turns out to be most serious, as was to be expected.

If the propeller or propellers have sufficient area of blade to be economically suitable for the power propulsion of the ship, the loss of speed when under canvas alone is about 25 per cent of the speed the same ship could attain under the same sails, with the same conditions of wind, but free of the obstruction of propeller or propellers. D. W. Taylor mathematically demonstrated with certain justifiable assumptions as to the flow of water past the blades that a diameter-pitch ratio of .35 was characteristic of the most efficient element of a propeller blade.

That means that approximately an angle of 45 degrees is the thwartships angle of the most efficient element of the surface of a propeller blade. When the pitch-diameter ratio of the tips of the blades is 1.5, the angle of the blades at their center of area is very nearly 45 degrees. It is easy to perceive that a coarse pitch propeller, if unclutched from the engine, will turn, under the action of the ship passing through the water, with much less resistance than a fine pitch propeller.

It was this characteristic of the early steamship propellers that made them efficient sailing vessels. All marine steam engines seventy years ago were slow-turning engines, and their propellers had pitches as coarse as twice the diameter. All early steamships were sailing ships, and expected to use their sails, to save coal, whenever and wherever possible. They were handicapped by heavy cumbersome, wasteful machinery, and coal bunkers that occupied valuable cargo space. The Victoria was an example of how well they could sail with disconnected screws. One of their great defects was the length of time it took to get up steam. They none of them had water-tube boilers, and hours were required to raise steam. It would often happen that the wind would fall

light just as the fires had been allowed to die out, and vice versa, the wind would spring up just as the boilers got good and hot and the propeller had been clutched to the engine.

Oil Engine Auxiliaries

The oil engine requires a high rotative speed, to keep cost, weight and space occupied down, and the result of directly driving the propeller from the engine has been to ruin the propeller, so far as sailing is concerned. The use of Bevis feathering screw-propellers would be one solution of this difficulty: the adoption of gearing between the engine and the propeller would be another. Probably the best solution of all would be the use of electric drive on the propeller shaft in combination with oil-engine driven dynamo and storage battery. Electrically driven mast-winch, capstans, windlass and drums would materially reduce the labor of working ship. If there is going to be a future auxiliary, it will undoubtedly have all the auxiliary machinery of a modern motorship, besides handling its sails by power instead of by hand. It is my belief that such an auxiliary can be designed that will on certain routes surpass even the true motorship in the economical transportation of cargo.

Combination Ore and Oil Steamer G. Harrison Smith

Delivered to International Petroleum Company



Combination oil and ore steamer G. Harrison Smith, recently delivered to the International Petroleum Company by the Sparrow's Point plant of the Bethlehem Shipbuilding Corporation

THE G. Harrison Smith, 20,000-ton combination ore and oil vessel built at the Sparrow's Point plant of the Bethlehem Shipbuilding Corporation, Ltd., for the International Petroleum Company, was delivered to her owners on September 12, after a very successful trial, which was run on August 30 at Sparrows Point, Maryland.

The vessel has a length overall of 571 feet 6 inches, a breadth of 72 feet, and a depth of 44 feet. She is equipped with three single-ended Scotch boilers and triple-expansion reciprocating engines with cylinders 25x41x68-inch diameter and 48-inch stroke. The boilers are equipped with the Bethlehem-Dahl mechanical oil burning system fitted with Howden type of forced draft.



Oil Engines and Motorships



PROGRESS IN MOTOR SHIP BUILDING

THE Emergency Fleet Corporation now has one first class sea-going motorship, the William Penn, and that good vessel, now on her maiden voyage, is demonstrating to the corporation the value of Diesel engine propulsion.

For the benefit of those of our readers who have not read the previously published descriptions of this vessel we will give her principal specifications.

She has a length of 455 feet overall, a beam of 60 feet, and a molded depth to shelter-deck of 36 feet 8 inches. Her deadweight capacity on 28 feet 4½ inches draft is 12,375 tons, of which 11,725 tons is net capacity for cargo. She has twin six cylinder, four cycle, directly reversible marine Diesel engines of 29.134 inch cylinder bore and 45.275 inch stroke, built by Burmeister & Wain of Copenhagen and installed by William Cramp & Sons Ship and Engine Building Company of Philadelphia. These engines at the designed speed of 115 r. p. m. have a rating of 2250 i. h. p. each.

On her deep sea trials the William Penn was not fully loaded, her mean draft being only 24 feet. In this condition, with the engines averaging 109.7 r. p. m., they developed a mean i. h. p. of 4202, driving the ship at 11.77 knots an hour on a fuel consumption for all purposes of 0.308 pounds per indicated horsepower. The fuel used was 29.4 degrees Baume Diesel oil with a thermal value of 19,450 b. t. u.

The William Penn at the time of this sea trial had in her holds 129,374 cases of oil, 500 barrels of grease, and a miscellaneous general cargo, amounting to a total of about 6200 tons. Immediately after her trials she cleared for Savannah on the first leg of a round the world voyage. At Savannah she loaded 3350 bales of cotton and 1450 barrels of resin. Twelve hundred tons of fuel oil were taken at New York. From Savannah the William Penn goes to Balboa, thence through the Canal to Honolulu, at both of which ports the fuel oil tanks will be filled

to capacity. Cargo will be discharged at Oriental ports and return cargo picked up there for the homeward trip via Suez and British ports to New York. The Barber Lines operating the William Penn have already arranged profitable return cargo.

The Kennecott is making some very creditable records in economy of operation and has been running coastwise with full cargoes and practically no maintenance or repair bills on her propelling machinery. This vessel, built by Todd Dry Dock and Construction Corporation of Tacoma, Washington, and engined by McIntosh & Seymour of Auburn, New York, is a more strictly American product than her larger sister and for that reason perhaps more interesting. As we go to press she has just completed her second round trip from Puget Sound to New York, and her engines have not been forced to shut down once during her entire sea experience.

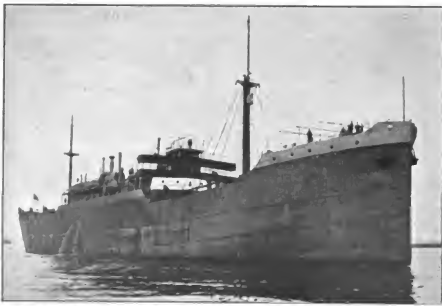
From that earlier motor tanker, the Charlie Watson, of the Standard Oil Company of California, comes the same report. The Charlie Wat-

son, a first class steel vessel of 2600 tons deadweight capacity, was built by the Union Construction Company and engined by the Pacific Diesel Engine Company, both of Oakland, California.

A larger tanker along the same lines, the H. T. Harper, of 4750 deadweight tons capacity, is just being delivered to the Standard Oil Company by the Moore Shipbuilding Company of Oakland, and thus with four first class sea-going steel motorships of respectable capacity the American merchant marine faces a desperate cut-throat competition in the overseas freight business, having already demonstrated on many lines that against European motorships competition with its steamers is quite hopeless.

In the meantime Great Britain, Sweden, Norway, Denmark, Germany, Italy and Holland are busy building great fleets of these economical carriers, in addition to their present motorship tonnage.

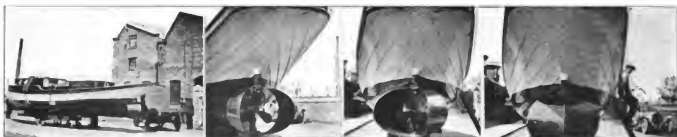
It is up to American shipowners in the overseas business to convert their wasteful steamers and up to the Emergency Fleet Corporation to assist in that good work.



United States Shipping Board sea-going motorship William Penn, 12,375 deadweight tons capacity on 28 feet 4½ inch draft

SOME OBSERVATIONS ON THE KITCHEN RUDDER

By R. Z. DICKIE



Left to right—Launch Abertay leaving shop for her trials, showing side view of Kitchen rudder. View of stern showing rudder in straight ahead position. Stern showing rudder hard aport. Stern showing rudder closed in hard astern position

CONSIDERABLE interest is being manifested in the launch Abertay, which is being operated on the Firth of Tay, Scotland, as a ferry between Tayport and Broughty-Ferry, as she is equipped with a Kitchen rudder to demonstrate its maneuvering qualities with an engine which operates in the ahead motion only.

The Abertay was built by the Abertay Engine Works of Tayport, and is 31 feet long by 7 feet 6 inches beam, with a draft of 1½ feet forward and 2 feet aft light, propelled by a gas engine with four cylinders 3¾ inches diameter by 4½ inch stroke turning about 870 revolutions per minute and delivering about 16 horse power. She is arranged with a cabin forward and cockpit in middle with engine in separate house, as is shown by the photographs, and is proving a very able sea boat in all kinds of weather.

To be as effective as possible an ordinary rudder should be placed in, or very near, the propeller race. This ensures that the speed of the water passing over the rudder will be greater than the speed of the vessel through the water by a varying value which may be as much as 30 per cent; and that in starting the ship from rest there will be a flow of water over the rudder, giving steering power before the vessel has much weigh on. Kitchen rudders do this in the most efficient way possible, since they not

only are in the propeller race but entrain it.

Messrs. D. & R. B. Scott of Abertay Works made a series of trials to demonstrate the peculiar qualities of the Kitchen rudder. The photographs, some of which were taken from the Tay bridge in a vertical position, show how perfectly the claims of the inventor are justified.

The diagram illustrates the various positions of the rudder and the resultant maneuvering qualities, and by comparing the same with the photographs the direction of the wake will bear out the diagram.

From full speed ahead to a standstill can be accomplished in less than a boat's length, and from full speed ahead the boat can be stopped in about two and a half times her own length with the engine not running. In turning it was found that she would make a complete circle at a radius of about 30 feet in 40

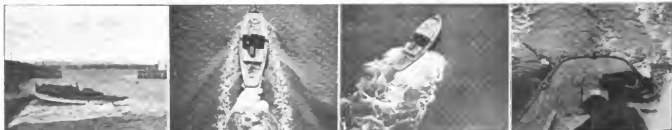
seconds, starting from full speed. In swinging astern, with the rudder hard over, half a circle can be accomplished easily within a radius equal to half the length of the boat.

A remarkable feature of this type of rudder is the control of the vessel when backing, as it has been considered almost an impossibility for the ordinary type of rudder, and this without changing the direction or speed of the engine.

A valuable asset in favor of the rudder which cannot be overlooked in the case of a high speed engine requiring a propeller with a low pitch is that the efficiency is not lost in backing as the engine always runs in one direction while with an ordinary reverse gear the low pitched propeller would be very inefficient for backing if properly designed for going ahead.

Experiments with Kitchen rudders have shown a gain in propeller efficiency when the rudder is partly closed. With the same power applied there has been a uniform gain in speed of approximately five to ten per cent over that obtained with the ordinary rudder, but the exact amount gained with the rudder closed is a matter of experiment, for no two boats seem to give the best results with the rudder closed the same amount.

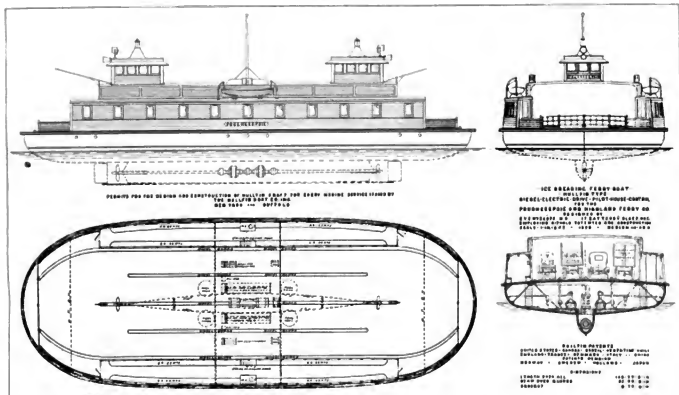
In conclusion it might be added that when a boat is equipped with a Kitchen rudder and in the hands of a skilful operator the control is almost absolute.



Left to right—Abertay maneuvering at dock swinging to port. View from Tay Bridge looking down on launch as rudders are closed to stop. View looking down showing launch almost stopped. Note action of rudder on water. View of wake full speed ahead. Above—side view of launch brought to stop position with engines full speed ahead.

THE DIESEL ELECTRIC ARCONSTRUCT-HULLFIN FERRY BOAT POUGHKEEPSIE

By C. V. S. WYCKOFF
Naval Architect



THE ferry boat Poughkeepsie, now being built by the Atlantic, Gulf and Pacific Company, Mill Basin, Brooklyn, for the Poughkeepsie and Highland Ferry Company, will be unique in several particulars. She will be one of the first commercial vessels to be propelled by the Diesel electric system; the first to be built with a "hull-fin" and on the "arconstruct" principle; and because of these features she will have an unusually large carrying capacity and is expected to be very economical in operation.

Conditions of Service

The Poughkeepsie will have a length over guards of 140 feet; a beam over guards of 52 feet; a beam of hull at water line of 46 feet; a draught of 9 feet; a displacement of 400 tons; and a speed of 12 knots. Her hull will be of steel and her superstructure of wood.

She will ply between Poughkeepsie and Highland on the Hudson River, a distance of about three-quarters of a mile; and the two special conditions of her service are a heavy automobile traffic in summer and thick ice in winter.

The use of the Diesel electric drive gives her exceptional carrying capacity because it permits of

a perfectly clear main deck without center casing or even a stack. Consequently she will have, in addition to two passenger cabins on this deck, four driveways instead of only the two permitted to steam-propelled ferries.

What this means can be understood by comparing the Poughkeepsie with the new Staten Island ferry, the largest of her type in America. Though this latter boat is to be 250 feet long and will have a 66-foot beam, she will have only 440 feet of driveway and a capacity of 28 cars, whereas the Poughkeepsie will have 472 feet of driveway and will be able to accommodate 32 cars.

In order to operate all winter the Poughkeepsie will have to contend with ice up to three feet thick, with occasional windrows down to the bottom of the river. She will, therefore, be very substantially built; but more especially her hull-fin design will permit her to overcome ice conditions that would tie up a boat of the ordinary type.

The Hull-Fin

As shown by the drawings, the hull of the Poughkeepsie is of very novel design. Instead of the regular narrow hull extending to the keel, she will have a comparatively

shoal hull with a "hull-fin" below. This hull-fin, which is patented by Captain Samuel Golden, has several special advantages.

The hull-fin places the propellers under the boat, where they are always immersed in solid water, instead of at the extreme ends, where the water is broken and where they can emerge in rough weather. This location, together with the shape and fine ends of the fin, greatly increases the efficiency of both propellers, and also permits of the use of propeller speeds that are much higher than ordinary practice, thus increasing the efficiency of the propelling machinery.

The broad hull with the fin keel imparts a high degree of stability to the vessel, owing to the breadth of the stability angles. The Poughkeepsie could, in fact, carry her entire load on one side without capsizing. She will also possess superior maneuvering power.

The ice-breaking features of the hull-fin design are obvious at a glance. Instead of wedging into the ice, the Poughkeepsie will ride over it, crush it with her weight, and then push it aside, exactly as the specially-designed Russian and Swedish ice-breakers act. Then, too, her

rudders and propellers are so placed as to avoid actual contact with solid ice, and the propellers will act as centrifugal pumps to draw the ice fragments out from under the hull.

The depth of the Poughkeepsie's hull will be 10 feet, its draught 3½ feet, and that of the hull-fin 5½ feet.

In the arconstruct system of design and construction, all the relative transverse sections are arcs of the same radii. In other words, every transverse curve in the hull, whether in the bottom, bilge or side, is a relatively longer or shorter arc of the same circle.

This simplification of the lines greatly reduces the cost of the mold loft, fabrication and plating work, and also increases the strength of the hull. Moreover, since the same arc is always presented to the water, the water when once disturbed follows the hull freely without further disturbance, the usual resistance of increasing area, and thus the ship-efficiency is still further increased.

Diesel Electric Propulsion

The use of the Diesel electric system of propulsion is in accord with the best marine engineering practice for this class of vessel. The high economy and unparalleled maneuver-

ing power of this drive are too well known to require discussion here.

There will be propeller controls in the pilot houses and in the engine room, and the pilot can directly and instantly control every movement of the boat. The fact that the Poughkeepsie will be able to accelerate to full speed in minimum time, come to a full stop from full speed in a few seconds, and reverse her motion in less time than is possible with steam drive, will not only improve her schedules but will decrease possibilities of collision or damage when entering the slip. She is, in fact, expected to make regularly three trips per hour instead of the two trips made by the present ferry boat.

Her main engines, as specified, will consist of two 150 horsepower, six-cylinder Winton Diesel engines of 450 r. p. m., each of which will drive a 90 kw. Westinghouse generator.

Her propellers, which are to be normally rigidly connected together, will be driven, according to specifications, by two 100 horsepower Westinghouse motors. Either or both engines, and either or both propeller motors, can be used at any time. The engine room will be located in

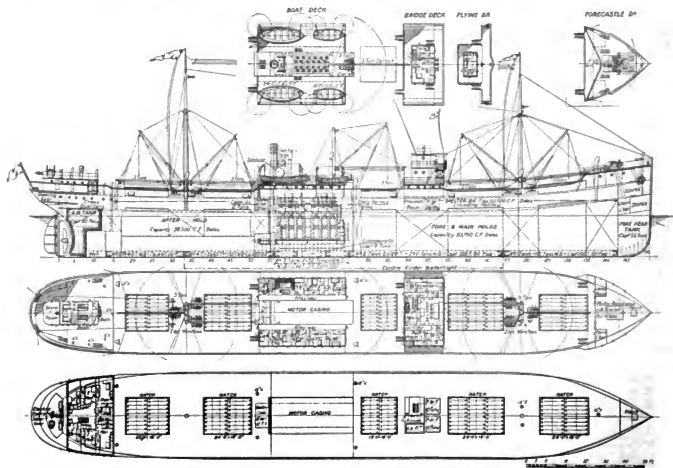
the Poughkeepsie's hull, and the propeller motors and shafting in the hull-fin.

The propellers will operate with full power at the unusually high speed of 600 r. p. m., but their location at the ends of the hull-fin makes this possible without cavitation or excessive slip. The propellers will be of the standard three-blade design, 48 inches in diameter and 28 inches pitch.

It is expected that the Poughkeepsie will be in operation by next spring.

RADIO FOG SIGNALS INSTALLED

It is the intention of the Lighthouse Service to establish additional radio fog signal stations at important points as rapidly as funds are available. Plans are now under way for installing a radio fog signal sending apparatus on San Francisco Light Vessel No. 70, California, and the lighthouse tender Sequoia, stationed in the eighteenth district, will be equipped with a radio compass. These will be the first installations of this character made by the Lighthouse Service on the Pacific Coast.



Single screw motorship *Leise Maersk* engine with long stroke slow speed Burmeister and Wain motor

THE FIRST BURMEISTER AND WAIN SINGLE SCREW MOTORSHIP

Messrs. Burmeister and Wain of Copenhagen, Denmark, stand out head and shoulders above all the world's shipbuilding and engineering firms in the application to marine propulsion of the full Diesel engine. Realizing the interest which has been aroused among shipowners by the uniform success of real motorships and anticipating a very wide and large demand for the conversion of existing steamships, they have developed a long stroke, slow speed Diesel motor suitable for the driving of single screw medium speed, average size freight carriers. In this article is described the first installation of this character in a new motorship.

SINCE the comparatively recent announcement by Burmeister and Wain, Copenhagen, that they had developed a long stroke, slow speed marine Diesel engine which was especially adapted for single screw cargo motorships, the operators and owners of ships have been looking forward with a great deal of interest to the first sea trial of this motor. Pacific Marine Review is now glad to be able to present to its readers an account of the results of the trial trip of the motorship *Leise Maersk*, the first vessel in which this type of engine has been installed.

The *Leise Maersk* is of the closed shelter-deck type with a length between perpendiculars of 299 feet 6 inches, a molded breadth of 44 feet, and a molded depth to shelter-deck of 28 feet 11 inches. She has a registered gross tonnage of 3015, a deadweight tonnage of about 4400, and a displacement tonnage of 6350 on a 22 feet $\frac{1}{2}$ inch draft. The capacity of the holds for bales is about 21,200 cubic feet. The specifications call for a normal average speed at sea of 10 $\frac{1}{2}$ knots per hour on a consumption of 5 tons of fuel oil per day.

Engine Dimensions

The engine is of the 4-cylinder type with 6 cylinders, having a diameter of 630 mm. and a stroke of 1300 mm. At 85 r. p. m. the i. h. p. is 1500 and the b. h. p. 1150.

On September 2, 1921, in four runs at sea with a displacement of 2204 tons and a mean draft of 8 feet 2 $\frac{1}{2}$ inches, the *Leise Maersk* averaged 11.71 knots per hour with the engines turning over 91.9 average r. p. m. and developing 1665 average i. h. p. The maximum h. p. developed over one nautical mile was 1710 with the engine turning 92 revolutions, producing a speed of 12.6 knots.

Low Fuel Consumption

In a test for fuel consumption, running at 88.9 r. p. m., the engines developed 1565 i. h. p. at a fuel oil consumption of 0.1265 kilograms per i. h. p. hour, the fuel used having a heating value of 18,350 b. t. u. This fuel consumption was considerably lower than the guarantee, amounting to 4.5 tons per 24 hours.

The main engine is of the enclosed forced lubrication type, cooling water and forced lubricating oil being furnished by electrically driven pumps. For nominal and continuous sea speed of 10.5 knots, these engines deliver 1150 b. h. p. at about 85 r. p. m. The compressor giving the necessary air (about 60 atms.) pressure for injection of the fuel oil is directly coupled to the crankshaft and built integral with the main engine. A governor of the Burmeister and Wain type, which can be set for any stipulated number of revolutions, immediately stops the supply of fuel oil to the cylinders in any emergency which would produce racing in the propeller.

Auxiliary Plant

Power for auxiliary machinery is supplied by three Diesel engine driven generators, any one of which can supply the necessary current for normal working at sea, the other two being standbys for use in port maneuvering, handling of cargo winches, anchor windlass, warping winch, etc. A small oil-fired boiler with a heating surface of 55 square feet is used for supplying steam for heating purposes.

The weight of the propelling unit with the auxiliary generating sets and all of the engine room auxiliaries, including floor plates, grating, ladders, airpipes, piping, silencers, spares, workshop tools, etc., is about 332 tons when designed with shafting dimension according to Lloyd's latest rules.

The weight of a corresponding steam engine installation on the single screw steamer *St. Thomas*, also built by Burmeister and Wain, is 337 tons. The machinery on the *St. Thomas* consists of a triple expansion engine developing 1150 b. h. p. at 80 r. p. m. and two Scotch boilers. The weight of steam machinery includes main engines and boilers, auxiliaries and fittings as are listed for the Diesel installation. Both weights include shafting and propeller.

The length of the engine room on the motorship *Leise Maersk* is 42 feet; length of boiler and engine on the steamship *St. Thomas*, 44 feet. The coal bunkers of the *St.*

Thomas take up 14 feet additional so that the Diesel motorship gains 16 feet in this comparison. The engine staff of the motorship consists of 7 men. The engine staff of the *St. Thomas* consists of 15 men.

The *Sulina*

The *Leise Maersk* was built by the Odense Shipyard for the Svenborg Steamship Company of Copenhagen.

A similar ship, the *Sulina*, powered with the same engines, was being built at the same time by the Ore-sunds Shipyard in Sweden, her engines being supplied by the Göta-verken.

The *Sulina* is 299 feet 6 inches in length between perpendiculars with a beam of 44 feet, a molded depth of 28 feet 11 inches, and a mean loaded draft of 22 feet 2 $\frac{3}{4}$ inches. She also has recently run successful sea trials, attaining a speed of 12 knots on a fuel consumption for all purposes of 5.1 tons per twenty-four-hour day.

The *Sulina* is owned by the Swedish Lloyd Line, which is controlled largely by Dan Bröström, who is so strongly in favor of the motorship that he is now preparing plans and specifications for a 20,000-ton, 18-knot trans-Atlantic motor liner for the Swedish American Line. The Swedish Lloyd Line has a third single screw ship similar to the *Sulina* and the *Leise Maersk* now being completed at a Swedish shipyard.

U. S. Shipping Board

TAKE NOTICE

The performance at sea of these single screw motorships should be of great interest to the United States Emergency Fleet Corporation, as this new type of motor makes possible the conversion of the ordinary triple expansion steam plant into an economical Diesel engine plant with little or no structural changes in the hull of the steamer. The Emergency Fleet Corporation now has quite a number of steel steamers running from 3500 to 5600 tons deadweight capacity which could be converted into very economical sea-going motorships by the installation of plants similar to those described in this article.

CONSOLIDATED BALANCE SHEET **THE AMERICAN SHIP BUILDING COMPANY AND SUBSIDIARY COMPANIES**

At the Close of Business June 30th, 1921

ASSETS		LIABILITIES	
PERMANENT		CAPITAL STOCK	
Land, Buildings, Equipment, etc.	\$ 1,001,496.41	PREFERRED—7% NON-CUMULATIVE	
GOODWILL		Authorized and Paid	\$ 11,000,000.00
As valued in the Company's books	5,075,160.00	Unpaid	1,000,000.00
CURRENT		COMMON	
On hand and on deposit	\$ 910,200.39	Authorized	\$ 15,000,000.00
U. S. GOVERNMENT SECURITIES		Unpaid	7,000,000.00
Liberty Bonds and Treasury		Unpaid	11,000,000.00
Interest	\$ 8,972,473.28		
U. S. Government Bonds			
Due to market value	\$ 5,309,714.54		
War Savings Bonds	800.00		
NOTES RECEIVABLE		CURRENT	
Customers' Notes and Accepted Interest	5,185.15	ACCOUNTS PAYABLE	
		For Purchases, Expenses, Unpaid Pay	\$ 285,262.42
ACCOUNTS RECEIVABLE			
Customers	\$1,066,372.85	ACCUMULATED DEFENSES	
Unsettled Day Work Charges	25,130.00	State, County and City Taxes, etc.	114,000.00
INVENTORY			
Materials and Supplies on hand and in process	\$ 729,375.74	EXPENSES DEFERRED	
Surplus Materials	245,378.11	Preferred 1%; Issued June 22nd, 1921, Payable August 1, 1921	100,000.00
Special Stock	40,171.17	Common 4%; Issued June 22nd, 1921, Payable August 1, 1921	200,000.00
OTHER ASSETS			
Completed Ships on hand	\$ 8,491,702.79	BONDS	
Notes Receivable and Accepted Interest (For Ship Sale)	2,512,500.00	For Fire Insurance	\$ 100,714.44
Bonds and Stocks and Accepted Interest	600,000.00	For Workmen's Compensation Insurance	1,000,000.00
Deposits, Advances, and Miscellaneous Assets, Receivable	127,000.00	For Additional bonds of ships belonging to Federal Government, etc.	17,400.00
		For Federal Taxes, etc.	4,200,000.00
DEFERRED			
Buildings, Machinery, Equipment, etc., paid and attached on account of War Production	\$ 9,117,400.00	PROPERTY AND EQUIPMENT	
Less Reserve for Amortization	5,800,000.00		
Prepaid Expenses, etc.	57,600.00		

THE American Shipbuilding Company of Cleveland is without doubt the largest shipbuilding institution in the world located on fresh water. Its annual statement is always a matter of interest because this company is so conservatively and so successfully financed and managed. Our readers will be interested in the reproduction of the consolidated balance sheet shown above and in the following excerpts from the annual letter to the stockholders of the company by President M. E. Farr:

"The results from operation for the fiscal year just ended, in view of the setback in shipping, and in consequence shipbuilding, are better than were expected. The shortage of cargoes in the deep-sea trade is largely responsible for the slump in water shipping at the present time. The impression prevails that the present depression in water shipping is caused solely by an over-production of vessels. Statistics recently published by Lloyd's Register prove that the world's steam tonnage, after eliminating wooden vessels and those obsolete, improperly designed and poorly constructed, is not greatly in excess of the tonnage in 1913. The cost of ship construction is still high, which it must be understood, bears no relation to the low prices now quoted for vessels already built. There are few enquiries for new

tonnage, and the prospects of the company's securing new business in the immediate future are not encouraging.

"During the year eight cargo ships, of 66,200 gross tons carrying capacity, were completed for company account. Four of these were bulk lake carriers and four of general cargo ocean type. The four lake ships have been sold at fair prices. Notwithstanding negotiations with foreign interests for the sale of a number of the ocean type ships were closed, the buyers either refused or were unable to carry out their part of the transaction. The Independent Steamship Company still holds title to ten ocean type ships, all of which are in first-class condition and now in ordinary.

"There were 260 vessels, aggregating 1,134,492 gross tons, dry-docked at the various plants of the company during the year. The repair departments have been kept moderately busy repairing and reconditioning vessels and rebuilding railroad equipment. The prospects for repair and replacement work during the coming year are fair.

"The frame building adjoining the Lorain Plant, known as the 'American House,' was sold in August, 1920, for \$7500. This property was carried on the company's books at \$2,321.03. Regular plant equipment, not needed, was sold for

\$113,491.96. Land forming a part of Lots Nos. 1, 2 and 3, St. Aubin Farm, Detroit Plant, has been leased for a period of ten years, at an annual rental of \$6,600, free from all taxes, maintenance and other expenses, with option to purchase within two years for \$107,616. Land located on the southeast corner of Pine street and Biddle avenue, Wyandotte, has been leased for ten years, at an annual rental of \$900, free from all taxes and other expenses, with option to purchase within two years for \$15,000. The land now occupied by the brass foundry, Detroit Plant, has been leased for ten years at an annual rental of \$1500, the company to pay taxes and expenses.

"The property of the company is in good condition and free of incumbrance. The cost of replacing property damaged by fire amounted to \$121,490.21, which with the exception of one item of \$838, was fully covered by insurance.

"The premium set aside during the year to cover workmen's compensation and public liability risks amounted to \$129,984.43, and the disbursements, actual and estimated, aggregate \$88,714.41. The carrying of this form of insurance by the company, has not only been satisfactory but has resulted in a very large saving."

FULL SPEED AHEAD

EDITED BY ANDREW FARRELL

Steamship Operations

What of the Future?

On the eve of a trade revival that may involve the larger portion of the world, steamship operators find themselves facing a situation of singular perplexity. So many old landmarks have been swept away by the storms of seven years that there is great difficulty in getting proper bearings. What will be the more remunerative trade routes at the end of five years, at the end of ten, at the end of twenty-five? Upon the answers to that question depends in a large degree the success or failure of individual companies and of the American merchant marine as a whole.

Things Have Changed

It is well enough to say that the old trade routes, as they were developed during a half-century of steam and several centuries of sail, will remain; so they will in great part, for the world has survived worse catastrophes than the World War and has groped its way back to normality again; but only the blind would fail to see that certain profound changes have come to pass. Aside from the temporary depression in countries relatively untouched by the war, and the more bitter and longer drawn out reconstruction era in devastated regions of Europe, both of which are altogether impermanent, there are certain factors making for change. Old trade routes will remain, yes, but as modified by at least three developments of the last seven years: new inventions, processes, manufactures and markets born of the war; the splitting up of a large part of Central Europe into small states, each of them possessing, in common with older nations, the power to erect tariff walls and other impediments to the free exchange of goods; and the opening of the Panama Canal.

There comes to hand such a part and significant example of the first that it may be considered in some detail. As the world knows, there was a great expansion of the Chilean nitrate trade during the war, principally because of the enormous manufacture of munitions. Chile ex-

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perienced a war-boom of proportions, unusual even in a world of war-booms, and with the noteworthy inability of the suddenly prosperous to reconcile themselves to change, strove bitterly against declining prices last year. What of Chilean nitrate today? During the calendar year 1920 shipments through the Panama Canal averaged 166,325 tons a month and attained 195,885 tons in January, 1921. Mark what has happened since: shipments of May were 43,504 tons; of June, 58,801; of July, 26,051; although August rose to 39,349 tons. Temporary depression? Not according to Alejandro Bertrand, European delegate of the Association of Nitrate Producers. He sketches the rapid rise of other fertilizers: prior to 1908 sulphate of ammonia was the only rival, and an inferior one, to nitrate; from 1909 to 1913 cyanide and nitrate of calcium began to appear, while the production of sulphate of ammonia increased rapidly; in 1913, synthetic ammonia was produced, attaining its maximum production in Germany in 1918, one year after nitrate reached its peak; sulphate of ammonia, extracted from coal, is waxing; and chloride of ammonia and other new salts are being produced. In 1913-1917, Don Bertrand sums up, nitrate represented 56 per cent of the world's fertilizer production; at the time his report was made, about the middle of the year, it had fallen to less than 35 per cent, with a further decline imminent.

Coal Also Involved

Any shipping operator may compute what the loss of such seaborne cargo means to the world's merchant marine. But that effect is not all. Coal shipments to the West Coast of South America declined, as a direct result of the nitrate depression, from 76,157 tons in January, 1921, to 1664 tons in July. The

nitrate and coal trades were mutually dependent, the Panama Canal Record points out, the decay of one involving a corresponding fall of the other.

It would not be difficult to multiply instances. There is, for example, the American production of dyes, hitherto largely bought in Germany. As cargo dyes may not be important, for a little bulk is very valuable; but Germany used dye exports to pay for such raw materials as cotton. Again: during the war American imports of Mediterranean silks declined greatly, with a resultant increase in purchases in the Orient; and on the other hand, Japan, which had bought its steel largely of Great Britain and Belgium, diverted to the United States an exceedingly brisk trade. Vegetable oils were imported in enormous quantities; copra attained a new importance, and the Manchurian soya bean was practically discovered by the United States. These and many other new trades and diversions of old were due principally to the war.

How Many Will Survive?

But how many are likely to survive? Japan already has seen Sweden return triumphantly to the match trade of Malaysia and India, which had been surrendered temporarily to Nippon. Is the fall of Chilean nitrate to be repeated in the case of Oriental raw silk? It was, in fact, so repeated last year, during the worst of our depression; but shipments are again on the increase. Japan doubtless can produce silk more cheaply than can the Mediterranean; yet what would happen if Japan were to transfer its steel trade again to Europe? Would we of America find other commodities for export sufficient to employ our Oriental tonnage and maintain our purchases in the Far East? Another factor may crop up here; the Washington conference on restriction of armaments also will consider Pacific and Far Eastern problems. There are many of those problems that are serious; it is to be doubted, however, whether any single one approaches Japan's lack of domestic iron ore. Only one can rank with it: Japan's demand for markets in Asia; but the two are closely akin; at any rate, Japan does

not need an outlet for so-called surplus population so much as it needs raw materials for its factories. Nippon can and will follow the example of Great Britain and Belgium and Germany there. But what of our Oriental steel trade if the conference should find a way to permit Japan to open up Chinese mines? Practically speaking, cotton and lumber would remain the only members of our present great triumvirate of raw or semi-manufactured exports to the Orient.

So much for a few examples of change, accomplished or potential. What of the many new states of the world and the erection of tariff walls by them and by other countries? Will open trade be realized in the hodge-podge of Central Europe? Will Germany find it possible to buy wheat of Poland, or will America and Canada find here a more or less permanent market? Portland, Oregon, has an interest here. What measure of success will be realized by the "nationalists" of India in their proposed boycott of foreign cotton cloth? Such a measure, if successful, would be felt by Great Britain, Japan and the United States, all manufacturers of cloth for export, and by every cotton-grower in the South, and, as a result, by every American and foreign steamship line. How far will that late insistent demand for the development and protection of "essential" industries go? To revert to the case of dyes: our domestic production of those essential goods certainly will react strongly on our seaborne trade with Germany. So with our agricultural tariff wall. If the Western wool-growers demand and receive protection, to what extent can Australia buy lumber and manufactured goods in the States? There remains also a somewhat disconcerting fact: the United States increased its manufactures enormously during the war, so that it became a dangerous rival to the older nations of Europe and to Japan in Asia. To what agricultural and grazing countries are all these manufacturing states to sell, especially, if, as in the case of America, a nation is both agricultural and manufacturing and is committed to the policy of protecting both interests?

We have finally the case of Panama. The influence of that canal on the world's commerce is only dimly apparent now and perhaps will not be fully disclosed for twenty-five years. This much is certain: Asia has been placed next door to the manufacturing centers of the Atlantic Coast; Australasia is closer to both the Eastern states and to Eu-

rope; the Pacific Coast of the United States and Canada has been moved many thousands of miles nearer to Europe. The trade routes between these sections of the world are the most promising now. Will they remain so? Have San Francisco and Seattle any opportunity to restore their old transcontinental import and export business? What of trade between the East Coast of South America and the fruit-growing districts of the Pacific? Is there, in view of shortened steaming tracks, a market for Douglas fir in Argentina? Will the Pacific Coast and Hawaii ever buy Atlantic coal in preference to that of Japan or Australia? Even today Honolulu is getting a shipment from Cardiff. In the event that the example of Hawaii is emulated by the Philippines, if that archipelago again is made attractive for American capital, if in short sugar production increases greatly, where will the crop go? If to New York or Philadelphia, as seems probable, what vessels will transport it? And will there be decreased imports from Cuba as a result?

Perhaps the most perplexing problem connected with Panama Canal and other trade routes is how to remedy the unequal movements of tonnage. Trade balances trade in terms of dollars, pounds, yen or taels; there is no tonnage equality; and there is likely to be none when steel is exchanged for raw silk or cotton for Sheffield cutlery. It is well known that the Pacific Coast of the United States is experiencing great difficulty in filling vessels in the Orient for return voyages, partly because Japan still has an "unfavorable" balance of trade and partly because of the disparity between values and tonnages of imports and exports. Instances of similar tendencies could be multiplied indefinitely. Take the Panama Canal statistics for any month or any year, but preferably for August, the last month reported at this time. A singular situation is encountered. Here are some movements in long tons:

There is not, in all that list, one balanced trade route. Perhaps the figures for any one month may con-

vey an exaggerated idea of the disproportion, but that in the main they are accurate may be seen by referring to the tables for the fiscal year, published on page 674 in this issue. Well, what can be done to remedy such a condition? If the tendency were strongly in one direction the answer might be a complete round-the-world service. In August the Atlantic-Pacific total was 317,970 and the Pacific-Atlantic 521,303 tons, a fact that indicates a pronounced eastbound superiority; but for the fiscal year there was almost an even balance, the Atlantic-Pacific being 5,892,078 tons and the Pacific-Atlantic 5,707,136. Here is no great disparity in the aggregate, yet individual trade routes were strikingly ill-proportioned.

No similar statistics of Suez Canal traffic are available, but the case probably is not greatly different.

Triangular Routes a Solution

What is the solution? To seek one before Europe becomes stable probably would be useless. When trade begins again, much the same condition doubtless will continue, for, as was pointed out, raw silk and steel scarcely have the same value a ton. Then the steamship operator probably will be compelled to search for bilateral or quadrilateral routes; but planning such routes calls for great skill and wide knowledge.

The fact is that there is little enough today to guide the operator. Normality is an ideal that has manifested itself little enough in the last seven years. From 1914 to 1918, inclusive, the world was at war; 1919 witnessed a tremendous trade caused by the imperative necessity of accumulating some stocks of essentials, and so that year accordingly was about as abnormal as 1918; general world-wide depression was manifest in 1920 and 1921. Yet the signs of revival, in the United States as well as Asia and to a lesser degree in Europe, point to the stern necessity of American steamship operators seeking for everything that can possibly serve as a guide. If they do not, John Bull and Watanabe Nippon will.

Trade Route	Atlantic to Pacific	Pacific to Atlantic
United States Coastwise	55,387	129,792
United States-Far East	112,454	29,308
Europe-United States	684	174,198
Europe-South America	23,500	45,625
United States-South America	10,949	47,717
Europe-Australasia	16,266	54,877
United States-Australasia	31,150	1,585
Canada-Europe	8,828	17,702
Mexico-South America	17,718	

Steamships and a Rail Strike

A good deal of loose thinking is being done regarding the role of intercoastal steamship lines in the event of a national railroad strike. There appears to be, on the part of many persons, an unreasoned assumption that the whole load could be transferred from railroad to steamship without any serious dislocation of business. Those who hold such a belief and act upon it are likely to find themselves in trouble.

From Dock to Dock

There is no doubt whatever that there are steamships enough, in view of the idleness of many and the small cargoes of those engaged in active service, to handle any conceivable amount of freight from dock to dock, from any port of the Pacific to any of the Atlantic. From dock to dock: there's the gist of the trouble. But how will merchandise be transported to tidewater? Although rivers and canals would be factors, yet reflection should convince anyone that the number of factories or mills having actual docking facilities on water, whether deep or shallow, must be very small indeed. A factory may be situated in Seattle, New Orleans or Boston and yet be as dependent upon a railroad for connection with tidewater as though it were five hundred miles inland. There remains, therefore, the necessity of land transportation, and with the railroads eliminated the motor-truck alone remains.

Despite the exaggerations of many of its so-called friends, who have had it supplanting the railroad, the automobile might be of great value in moving essential foodstuffs. The cost of transportation in this case would be of secondary weight. But what of low-value, bulky commodities such as coal, steel, fertilizers, lumber, which go far toward maintaining the industrial life of the country? Can anyone imagine them being moved in any quantity by truck? How many three-ton trucks would be needed to fill a steamship of 9000 tons deadweight, of 12,000, of 14,000? At the middle of October there were about 86 steamships engaged in the intercoastal trade. Are there enough trucks in the world to handle their cargoes even a hundred miles inland from tidewater? What of Pittsburgh steel moving to the Pacific Coast by intercoastal steamship; what would transport the steel to Baltimore or New York? How would Kentucky tobacco be landed in New Orleans, even with the Mississippi-Warrior barge service in operation? Resin

is produced in the interior states of the South. Will it be hauled several hundred miles by automobile? It is true that much Pacific Coast canned goods and cotton piece goods and hardware of New England might be delivered to docks by truck, but how would such commodities be spread from New York to Chicago or from San Francisco to Ogden?

Embargoes Probable

Besides all these adverse factors, there remains the probable imposition of embargoes at the principal seaports of both coasts. A national railroad strike would result in congestion in many a port that would overshadow the worst that Havana experienced last year, and in self-defense the ports probably would be compelled to shut out all except essentials.

It appears that the intercoastal steamship lines would lose as much or more than they would gain. Some new business would go to them; they would lose an enormous amount now delivered by the railroads; and they could not, in any case, make their influence felt more than a few miles inland.

During a hundred years American railroads became practically self-sufficient transportation systems; the intercoastal, as well as the deep-sea, steamship remains dependent upon the rail line. To believe otherwise is to cherish false hopes.

The I. C. C. Specter

At a recent meeting of the North Atlantic-Pacific Westbound Conference, W. J. Love, vice-president of the Emergency Fleet Corporation in charge of the traffic department, urged upon the members of the conference the advisability of living up to its regulations. The Shipping Board, he said, had power to check such abuses as rebating, making various concessions and violating in other ways the conference agreement, but it preferred that the members voluntarily mend their ways. In the course of further discussion, one line admitted that it had cut a rate on cast-iron pipe in order to permit Philadelphia to compete with New Orleans, this particular instance apparently being what Mr. Love had uppermost in his mind. Just prior to adjournment Mr. Love, again addressing the members, reminded them that there was in Washington a vigorous movement, almost tantamount to a lobby, to have the intercoastal steamship lines placed under the jurisdiction of the Interstate Commerce Commission.

This Is News

If Mr. Love "reminded" the conference of the existence of this move-

ment, then it is something with which that body was familiar. Not so with the general public. That such a campaign is in progress is in the nature of news; news, too, of a great deal of importance, bearing, as it does, not only upon the regulation of intercoastal steamship services and rates, but also upon the competition of steamships with railroads and the obligation of the Interstate Commerce Commission to see that the latter earn 5½ per cent.

Very little opposition indeed is to be expected from the railroads to such a plan. They are wedded, for better or worse, to the I. C. C.; but by no token would they object to seeing their mate become polygamous or polyandrous by taking another spouse. The larks of some steamship lines doubtless would come to a sudden end under the sobering roof-tree of the commission; gone the poker game and the now tabued bottle; gone, too, the merry stroll home through quiet railroad streets lined with sleeping houses. Such doubtless are the thoughts of the railroads as they sit by the fire and spin; it is a matter to cause surprise, however, that some influential steamship men (who are not wont to participate in many mad parties) hold similar views. They also would like to see the gayety ended. They regard some sort of regulation as certain and much prefer the Interstate Commerce Commission to the Shipping Board, which appears to them as being more or less a political plaything and not at all of the standard of the railroad body.

A Quick Thinning Out

Yet another consideration, not devoid of self-interest, underlies the willingness of some lines to join the I. C. C. family. They believe that the wilder blades among the intercoastal companies would have a good deal of difficulty in remaining in business once the commission had taken hold. Inability to cut rates or make other and more devious concessions might make the weaker lines unable to compete with their stronger brethren and perhaps with the railroads as well, with a consequent immediate thinning out of those companies that have remained in business only because of their violations of conference regulations.

Despite the potency of these considerations, there are traffic authorities who are unable to believe that the steamship companies, or any of them, for that matter, would be willing to submit to the yoke of the I. C. C. Such individuals point to the great cost of filing tariffs, making reports and complying with the intricate and multitudinous rules of

the commission. They assert, also, that heretofore the intercoastal lines have shown a desire to avoid the commission, for they have not quoted joint rail-and-water rates, apparently for fear of incurring supervision, and have carried this policy to such a point that they send vessels to Oakland, California, to be berthed, despite the fact that transshipping cargo by rail oftentimes would be cheaper.

That 5½ Per Cent

Perhaps, too, these traffic authorities believe that the Interstate Commerce Commission would hold paramount the necessity of the railroads earning minima of 5½ per cent and would base steamship rates accordingly. And increased rates received by the intercoastal lines might not necessarily mean more revenue, inasmuch as a good deal of their business is due to their relatively low rates; all other factors being equal, there is little doubt that the majority of shippers would prefer to deal with the railroads, which never mention general average and to which marine insurance is alien. The I. C. C. could divert a great deal of traffic from steamship to railroad by the simple expedient of increasing water rates, although it is quite true that some steamship lines would be able to compete with the transcontinental railroads in almost any circumstances; but such lines are first-class and are relatively few.

On the other hand, it does not necessarily follow that I. C. C. supervision would be attended by any policy detrimental to intercoastal shipping. So long as railroad and steamship are in direct competition, the tariffs of the former are likely to be reflected in the latter; not invariably, but usually. Well, the railroad makes a rate that is "reasonably" remunerative, that exceeds the actual out-of-pocket cost of handling the traffic; in this event, the commission probably would be inclined to let the rate stand; now comes the steamship with a quotation 20 per cent or so less. But who can doubt that the rail rate would be much more than barely remunerative if there were not that bogey of steamship competition in the background? And might not the I. C. C. take a hand and hinder the workings of direct competition by insisting that steamship rates be raised?—this for the purpose either of increasing railroad tariffs beyond the "reasonably compensatory" minimum or of diverting trade from the water line.

This Is the Trouble

By and large, the railroads at the present time are rather resigned to

seeing their old seaboard-to-seaboard business handled by steamships. What the transcontinental carriers do object to most vigorously, however, is the spectacle of freight destined from New York to Salt Lake City, let us say, moving via the Panama Canal to Los Angeles or San Francisco and thence by rail to its destination; or from San Francisco to Cleveland via New York. The existence of such traffic routes illuminates the situation greatly and makes clear one of two conclusions: railroad rates are too high or steamship rates are too low. Inasmuch as quite a number of intercoastal shipping companies are making money, the second suggestion is likely to be rejected.

There is more than one interesting potentiality here and the success or non-success of the Washington lobby will be watched closely.

The Philippines and the Coastwise Law

There is good reason to believe that President Harding intends to proclaim that adequate American shipping services exist between the United States and the Philippine Islands and that accordingly the coastwise laws will be extended to the archipelago soon after February 1, 1922, the earliest date when such extension could be made under the Merchant Marine Act. For several months the Shipping Board has been building up the Pacific Coast-Philippine service, with the result that the Pacific Mail has a direct service via Honolulu and also, in common with the Pacific Steamship Company, has the usual indirect service via Japan and China. At the present time the Pacific Mail has three 535's in the indirect service and three 502's in the direct and the Pacific Steamship has received notice that the last of its five 535's has been allotted. In addition to these combination vessels there are freight lines.

They Are Calmer

Recent developments in the Philippines, such as the appointment of General Wood as governor-general, the evident fact that talk of immediate independence is bosh, the much more subdued tone of Manila politicians, the severe strictures that have been passed on native policy and the growing restiveness of Americans at the trend of events, all indicate that the islands will accept inclusion within the coastwise laws a great deal more calmly than they would have done eighteen months ago. The failure of the legislature to make its perennial demand for independence is significant of the moderating temper of the islands.

Much interest attaches to the plans of American steamship lines to extend their services to Manila and other ports. It is an open secret that the Matson Line has such plans, as it would have in view of its close relationship with Hawaiian sugar planters who have large Philippine holdings. The Oceanic Steamship Company is another that probably would view a Manila service favorably, inasmuch as John D. Spreckels, president of the Oceanic, has great sugar interests in the Philippines, although up to this time the crop has been transported largely by vessels of the Java-Pacific Line, for which the Oceanic company is agent. The J. P. L. of course would be shut out of the Philippine service because of the Dutch registry of its vessels.

Benefit Trans-Pacific Lines

All foreign lines now calling at Manila probably would suffer by the extension of the coastwise laws, but the T. K. K. and Blue Funnel, by reason of their large hemp cargoes, probably would be hit hardest. Their business would go largely to the large and fast combination vessels, it is believed on the Pacific Coast, for direct Atlantic-Philippine freighters probably would have much difficulty in competing with trans-Pacific steamships, even though the latter would have to discharge their cargo for rail or water transshipment to the Atlantic.

The Bareboat Charter

Only two bareboat charter ripples have disturbed the Pacific. One is the taking by the Pacific Steamship Company of two vessels to load grain at Portland and Seattle for Europe at 50 cents a deadweight ton. The other is the refusal of the Shipping Board to charter to a company operating government tonnage under the MOA agreement. Neither of these is of great significance, for the Pacific Steamship charters, although the first closed, are for bulk cargoes and not for the general berth; and as regards the other development, the reasons that actuated the board are not altogether clear and may have no bearing on the broad question of competition between chartered and allocated tonnage.

New Form Not Completed

Despite the closing of the Pacific Steamship charters, the new bareboat form had not been completed at the middle of October. The party used for the two vessels was merely the draft so far as it had been completed at the time; and the final form, at this writing, has not been made public.

The rate of 50 cents a deadweight ton does command attention. It ex-

ceeds by quite a few cents the maximum charter that shipping men generally expect the board to get for its vessels, but that is no sign that there can be any appreciable amount of chartering at the same rate. In fact, as things are today, despite the improved outlook for export trades, it is doubtful whether operators would consider any sum in excess of 25 or 30 cents a deadweight ton a month. Dant & Russell have taken a time charter for one year of three 8800-ton Norwegian freighters at \$1.10; over in Japan recent brisk shipments leave operators cold and they are not taking much tonnage at yen 2.50, which is equivalent to \$1.25 American gold, but exceeds by 13 cents or so the recent British rate of 6 shillings. The Japanese prefer to contract for their space instead of to charter.

Might Consider Reductions

What does the 50-cent rate mean then? One view is that the board regards it as the minimum; the other, and apparently the more plausible, is that the rate merely is a point of beginning and that reductions might be considered.

Indications multiply that the board will not disrupt its allocated services by indiscriminate chartering. It will be recalled that both the American Steamship Owners' Association and the Pacific American Steamship Association, on discussing the bareboat form several months ago, insisted that allocated vessels should not compete with chartered; but when the associations assumed that attitude they took for granted that the old-time operators under MO4 would have the first opportunity to take vessels on the bareboat form. What, then, of vessels being chartered and competing directly with allocated tonnage? Although the situation is the reverse of what the shipowners had in mind, it simmers down to much the same thing: the company operating government vessels, whether under MO4 or a bareboat charter, whichever happens to be the prevailing plan at the time, expects protection against indiscriminate competition of vessels taken under the other arrangement. There appears little doubt that the board intends to comply with that demand, even though announcement was made October 7 that the board had decided to charter vessels on the bareboat form for trans-Pacific voyages.

Allocation System Doomed

Nevertheless, the allocation system appears to be doomed. Some few routes may remain untouched, of course, but many will go. If the

change be made gradually and business improve sufficiently to warrant bareboat charters and the board make an attractive rate, little harm probably would result; but in spite of recent improvements business has a long road to travel and the 50-cent rate, it should be emphasized, is not attractive.

For the present there is little danger that there will be any general withdrawal of allocated tonnage, notwithstanding rumors afloat on the Pacific Coast. Most freighter operators are down to one sailing a month, which is almost the irreducible minimum if a line is to be maintained at all.

Times Not So Bad

For some time it has been evident that many individuals who could see nothing but gloom in the present shipping situation were suffering from short memories, or, indeed, had no long experience on which to base comparisons. Not so many complaints are being heard from Japan, however, because the older shipowners of the empire have put themselves in a position to weather gales and also have experienced worse times than these. Proof of the latter statement is found in a tabulation of dividend rates of some principal Japanese lines, the 1921 figure being for the first six months only.

	'14	'19	'21
Nippon Yusen Kaisha.....	10	60	25
Osaka Shosen Kaisha.....	10	60	10
Toyo Kisen Kaisha.....	6	50	10
Meiji Kaiun Kaisha.....	20	....	....
Taisho Kisen Kaisha.....	45	....	....
Kawasaki Dockyard.....	8	40	20
Osaka Iron Works.....	35	20	....
Yokohama Dockyard Co....	35	15	....

In the following table Wakamatsu-Yokohama coal rates generally accepted as standard coastwise quotations of Japan; charter rates, and average prices of vessels are compared, figures being in yen:

	Coal Rate	Charter Rate	Price Ship
1914—			
July	0.76	1.76	40
1919—			
October	10.00	12.00	420
1920—			
April	4.65	9.50	350
June	4.33	8.00	300
August	2.43	5.50	300
October	3.10	4.50	250
December ..	2.37	3.80	200
1921—			
January	1.73	3.00	180
March	1.77	3.00	150
May	1.90	2.90	180
June	1.95	2.98	150
July	1.85	....	150

Charter rates of May and June are for near-sea services, no standard quotations having been made for off-shore trades.

Although a marked improvement in Japanese shipping has been manifest, about 50,000 deadweight tons of idle vessels having been put into service during July, there is little change in the steady decrease of vessels chartered to foreigners. The following table shows the number of vessels and deadweight tonnages by months of 1921:

	No.	D.W.T.
January	36	133,168
February	33	110,819
March	27	87,428
April	29	90,995
May	26	86,927
June	29	94,515
July	20	65,900

Of the twenty vessels under charter at the end of July, nine were to Chinese and the remainder to Britons and Americans.

The two 11,000 deadweight ton motorships under construction for the American-Hawaiian by the Merchant Shipbuilding Corporation will be named Californian and Missourian. They will be launched about November 11. The original A-H. vessels of these names were sunk during the war, the Missourian in the Mediterranean and the Californian off the north coast of France.

The Alaska Steamship Company will act as Puget Sound agent of the Williams Line, effective October 1, succeeding the Thorndyke-Trenholme Company.

The Yamashita Kisen Kaisha, which recently opened an Oriental-North American-Australasian service, has entered the Japan-Tsingtao field in competition with the O. S. K., N. Y. K. and Harada Kisen Kaisha.

The Pacific Steamship Company has been allotted the combination 535 Pine Tree State. When she is turned over about November 1 the company will have five vessels of her class.

Fahy & McNulty, for many years San Francisco representatives of the British-American Tobacco Company, have incorporated under the name of the Western Terminals Company and will engage in weighing, reconditioning, strapping, general stevedoring and ship clerking.

No Sympathy Here

The Japanese Shipowners' Association has decided not to submit to the international conference in London in November the proposal of the Kurihara Shosen Kaisha that 30 per cent of the world's tonnage be tied up, say advices from the Orient. Only the United States would be aided by such a plan, inasmuch as it had at the end of July 3,500,000 tons of idle shipping, or 28.6 per cent of its total, as against Britain's 2,000,000 tons, or 10 per cent; Japan's 140,000 tons, or 4.5 per cent, and France's 300,000 tons, or 9.8 per cent. The total of the four countries was 7,940,000, or 14.64 per cent. These are rough estimates submitted to the association, which has displayed consistency by deciding to be rough toward the United States.

Besides the desire of Nippon not to aid Mr. Lasker, the following reasons were of weight:

It is doubtful that the raising of freight rates would result in active movement of cargo.

The proposal is too artificial and it is feared that the Department of Communications would intervene in such an artificial method of adjustment of depression.

At a time when the tied-up vessels in Japan are steadily decreasing, such a proposal would only aggravate the depression.

Except for its ignoring the fact that such a plan could not be expected to succeed, the Japanese Shipowners' Association appears to have covered the ground well.

The Year at Panama

The most important trade route through the Panama Canal in the fiscal year ending June 30, 1921, on the basis of total cargo shipped, was that between the Atlantic Coast of the United States and the West Coast of South America, says the Panama Canal Record. Of the total of 11,599,214 tons of goods shipped through the canal during the year, 1,908,858 tons were moving over this route. This was 16.46 per cent, approximately one-sixth, of the total cargo handled. Shipments from the United States to the West Coast of South America were 933,261 tons; and from the West Coast to the United States, 975,597 tons.

The Largest Trade

The heaviest shipments one way over any route, however, were those from the Atlantic Coast of the United States to the Far East. This

amounted to 1,213,906 tons, over one-tenth of all the cargo handled. But return shipments over this route amounted to only 428,044 tons; the total moving between the areas by way of the canal was accordingly 1,641,950 tons, which was less than the total movement between the East Coast of the United States and the West Coast of South America. The combined United States-Far East cargo movement through the canal, 1,641,950 tons, was 14.15 per cent, or slightly less than one-seventh of the total cargo passing through the canal in the period.

United States coastwise traffic was third in importance, in total quan-

tity of cargo handled both ways. The combined shipments amounted to 1,372,388 tons, of which 698,429 tons were shipped from Atlantic to Pacific and 673,959 tons from Pacific to Atlantic. The total was 11.83 per cent, over one-ninth of all cargo carried through the canal during the year.

The route fourth in quantity of total cargo was that between the West Coast of the United States and Europe, and the fifth was that between the West Coast of South America and Europe. The figures for these routes, as well as for the others by which cargo was classified, are presented in the following table:

COMMERCIAL TRAFFIC THROUGH THE PANAMA CANAL DURING THE FISCAL YEAR 1921, BOTH WAYS, OVER PRINCIPAL TRADE ROUTES.

Route.	Direction.	Number of ships.	Panama Canal net tonnage.	Tons of cargo.
Between east coast of United States and west coast of South America.	A. to P. P. to A.	251 239	837,351 278,808	933,261 975,597
Total.....		492	1,116,122	1,908,858
Between east coast of United States and Far East.....	A. to P. P. to A.	187 74	915,720 351,904	1,213,906 428,044
Total.....		261	1,267,624	1,641,950
United States coastwise.....	A. to P. P. to A.	177 145	783,429 647,557	698,429 673,959
Total.....		322	1,430,977	1,372,388
Between west coast of United States and Europe.....	A. to P. P. to A.	89 158	343,028 782,117	111,291 1,154,849
Total.....		248	1,125,145	1,266,140
Between west coast of South America and Europe.....	A. to P. P. to A.	136 178	533,323 741,148	267,166 927,497
Total.....		314	1,274,471	1,194,663
Between Australia and Europe.....	A. to P. P. to A.	72 100	489,703 791,530	291,848 359,743
Total.....		172	1,281,233	651,591
Between east coast of United States and Australia.....	A. to P. P. to A.	90 27	476,854 156,283	620,428 147,877
Total.....		117	633,137	768,305
Between east coast of Mexico and west coast of South America.....	A. to P. P. to A.	77 79	363,466 490,455	654,659 230
Total.....		156	783,921	654,889
Between east coast of Mexico and west coast of United States.....	A. to P. P. to A.	27 49	113,046 204,977	261,205 8,155
Total.....		67	348,023	269,360
Between Cristobal, C. Z., and west coast of South America.....	A. to P. P. to A.	151 155	228,108 237,486	53,190 139,347
Total.....		306	465,594	272,537
Miscellaneous trade routes and sailings.....	A. to P. P. to A.	297 254	566,900 679,619	391,378 672,643
Total.....		421	1,237,569	1,258,021
Battlehips, cruisers, etc., other than United States.....	A. to P. P. to A.	14 2	(*) (*)	.....
Total.....		16	(*)	.....
Grand totals.....	A. to P. P. to A.	1,471 1,421	5,760,902 5,674,974	5,892,078 5,707,136
		2,892	11,435,876	11,599,214

A. to P.—Atlantic to Pacific. P. to A.—Pacific to Atlantic.

* Panama Canal net tonnage unavailable; displacement tonnage aggregated 87,473.

† Panama Canal net tonnage unavailable; displacement tonnage aggregated 36,888.

‡ Total displacement tonnage of 124,361.

The preponderance of cargo movement in one direction over some of the routes is striking, notably in the traffic between the Atlantic Coast of the United States and the Far East and between Europe and the West Coast of both North and South America. The movements from Atlantic to Atlantic, and those from Pacific to Atlantic, are shown separately in order of quantity in the tables following, which also state the percentage of cargo which passed over each route:

Third place, however, which had been held by the traffic between Europe and South America in the calendar year 1920, was taken in the fiscal year by the United States coastwise trade. The Europe-South America traffic decreased from 1,322,623 tons to 1,219,665, while the United States coastwise trade increased from 1,061,652 to 1,372,988 tons. The Europe-South America traffic occupied fifth place in the fiscal year 1921. The fourth place was

the canal from Atlantic to Pacific in the fiscal year, 3,712,029 tons, or 63 per cent, originated in the United States; 1,071,782 tons, 18.2 per cent, in Mexico; 545,419 tons, 9.3 per cent, in British Isles; 262,926 tons, 2.3 per cent, in other parts of Europe, and smaller quantities in other areas.

Of the 5,892,078 tons passing from America, 22.3 per cent to the Far West to the West Coast of South America, 22.3 per cent to the Far East, 20 per cent to the West Coast of the United States, 18.4 per cent to Australasia, and small quantities to the other areas shown in the table.

Pacific to Atlantic

The total cargo movement from Pacific to Atlantic during the year amounted to 5,707,136 tons. Of this quantity, 40 per cent originated on the West Coast of South America, 34.1 per cent on the West Coast of the United States, 12.7 per cent in Australasia, 8.9 per cent in the Far East, and smaller proportions as shown in the table.

Of those 5,707,136 tons from Pacific to Atlantic, 39.4 per cent was destined to the East Coast of the United States, 30.9 per cent to the United Kingdom, 19.6 per cent to other parts of Europe; and the remaining 10.1 per cent was distributed as shown.

Combined Origins

The total quantity of cargo handled in both directions was 11,599,214 tons. In shipping 3,712,029 tons of that from Atlantic to Pacific and 1,948,848 of that from Pacific to Atlantic, the United States was the country of origin of a total of 5,660,877 tons, or 48.8 per cent, of the total cargo shipped.

South America shipped 2,280,593 tons from her West Coast, and 27,507 tons from her East Coast through the canal, a total of 2,308,100 tons, or approximately 20 per cent of the aggregate movement.

Canada shipped 39,561 tons through the Canal from her East Coast and 125,638 tons from her West Coast, aggregating 165,199 tons, or 1.4 per cent of all shipments.

Mexico shipped 1,071,782 tons from her East Coast through the canal, but such shipments as came from her West Coast were bulked with those from the West Coast of Central America, which amounted to 49,265 tons. Total shipments from Mexico were about 9.4 per cent of the grand total.

No other areas classified sent cargo through the canal in both directions.

COMMERCIAL TRAFFIC THROUGH THE PANAMA CANAL DURING THE FISCAL YEAR, 1921, BY TRADE ROUTES.
ATLANTIC TO PACIFIC.

	Number of ships.	Panama Canal net tonnage.	Tons of cargo.	Percentage of cargo.	
				Atlantic to Pacific.	Both directions.
East coast of United States to Far East	187	915,720	1,213,006	20.69	10.46
East coast of United States to west coast of South America	253	837,254	933,261	15.84	8.05
United States coastwise	177	783,420	698,479	11.85	5.02
East coast of Mexico to west coast of South America	77	383,466	454,650	11.11	5.64
East coast of United States to Australasia	60	476,454	620,428	10.53	5.35
Europe to Australasia	72	489,763	591,848	6.65	3.38
Europe to west coast of South America	136	533,223	297,166	5.04	2.56
Mexico to west coast of United States	27	143,044	261,205	4.41	2.25
Europe to west coast of United States	80	383,028	144,591	2.46	1.25
Cristobal to west coast of South America	151	228,108	85,190	1.45	0.74
East coast of United States to west coast of Canada	13	59,398	82,827	1.40	0.72
East coast of United States to Balboa, C. Z.	7	42,531	69,128	1.17	0.60
Cristobal, C. Z., to west coast of United States	24	33,578	32,048	0.54	0.27
Cristobal, C. Z., to west coast of Central America	32	21,013	15,227	0.26	0.13
West India to west coast of United States	4	10,521	3,466	0.06	0.03
West India to west coast of South America	4	1,414	1,414	0.04	0.02
Miscellaneous trade routes	123	384,008	386,187	6.55	3.33
Warships, cruisers, etc., other than United States	14				
Total	1,471	5,740,902	5,892,078	100.00	50.80

PACIFIC TO ATLANTIC.

	Number of ships.	Panama Canal net tonnage.	Tons of cargo.	Percentage of cargo.	
				Pacific to Atlantic.	Both directions.
West coast of United States to Europe	158	782,117	1,154,840	20.23	9.96
West coast of South America to east coast of United States	229	778,968	975,597	17.09	8.41
West coast of South America to Europe	178	743,148	922,499	16.16	7.93
United States coastwise	145	647,557	677,959	11.51	5.81
Australasia to Europe	100	701,530	579,745	10.16	5.00
Far East to east coast of United States	74	351,904	428,044	7.50	3.99
West coast of Canada to Europe	22	105,234	154,512	2.71	1.33
Australasia to east coast of United States	27	156,283	147,877	2.59	1.28
West coast of South America to Cristobal, C. Z.	135	237,460	139,547	2.45	1.20
West coast of South America to Azore Islands	17	59,910	106,190	1.87	0.92
West coast of South America to West India	32	30,696	47,989	0.84	0.42
West coast of Central America to Cristobal, C. Z.	39	25,723	17,378	0.31	0.15
West coast of United States to Cristobal, C. Z.	23	41,976	14,578	0.26	0.13
West coast of United States to east coast of Mexico	40	204,977	8,155	0.15	0.07
West coast of Central America to east coast of United States	4	3,214	1,431	0.03	0.01
West coast of South America to east coast of Mexico	79	480,435	530		
Balboa, C. Z., to east coast of United States	9	51,448			
Balboa, C. Z., to east coast of Mexico	6	46,972			
Miscellaneous trade routes	89	307,466	333,844	5.85	2.87
Warships, cruisers, etc., other than United States	2				
Total	1,421	5,674,974	5,707,136	100.00	49.20

In the calendar year ending December 31, 1920, the total cargo carried through the canal was 11,236,119 tons of cargo. The 11,599,214 tons passing through the canal in the last fiscal year were 363,085 tons more than during the calendar year, a gain of 3.2 per cent.

In the calendar year the leading route was, as in the fiscal year, that between the United States and South America, with a total of 2,341,242 tons; and second place was held by the traffic between the United States and the Far East, aggregating 1,827,913 tons.

taken by the trade between Europe and the West Coast of the United States, with 1,299,431 tons. The latter route was fifth in the calendar year, with 859,848 tons.

The route between Australasia and Europe occupied sixth place in both the calendar and fiscal years. The tonnage of cargo moving over it in the calendar year was 770,403 tons. For the fiscal year it was 971,593 tons.

Atlantic to Pacific

A summary by origin and destination shows that of a total of 5,892,078 tons of cargo passing through

With respect to the receipt of the total of 11,599,214 tons which made up the traffic in both directions, the Atlantic Coast of the United States was the destination of 2,248,843 tons and the Pacific Coast of 1,176,424 tons, a total of 3,425,267 tons. This was 29.5 per cent of the total handled.

South America received 1,938,542 tons on the West Coast, and any receipts on the East Coast through the canal were not classified. South America was the destination of about 16.7 per cent of all the cargo, approximately one-sixth of the total shipments through the canal.

Canada received 126,414 tons on the West Coast and 16,558 tons on the East Coast, through the canal. The total, 142,972 tons, was 1.2 per cent of the total movement. The receipts in Mexico are not classified separately and no other classified areas received cargo from both directions through the canal.

Combined Shipments and Receipts

The United States, through originating or receiving cargo (doing both, of course, in the case of the 1,372,388 tons handled in the United States coastwise trade), participated in the handling of 9,086,144 tons. Similarly, South America either shipped or received a total of 4,246,642 tons. Canada was concerned in the handling of 308,171 tons. The total in which Mexico was concerned was 1,071,782 tons, as far as classified.

Of those countries or areas not so situated as to receive cargo passing through the canal in both directions, the United Kingdom, despatching 545,419 tons and receiving 1,763,431 tons, participated in the handling of a total of 2,308,850 tons through the canal; other European countries, despatching 262,926 tons and receiving 1,116,115 tons, were interested in a total of 1,379,041 tons. The West Indies shipped 92,667 tons through the canal and received 136,334 tons, a total of 229,001.

On the Pacific side, shipments to the Far East through the canal were 1,311,641 tons, and from it, 506,072 tons, a total of 1,817,713 tons. Shipments to Australasia amounted to 1,081,875 tons, and shipments from that area to 726,949 tons, a total of 1,808,824 tons.

More Canal Statistics

Commercial traffic through the canal in August was greater than it had been during any month since March, 1921. The month of March established a high record in tonnage of vessels and tolls earned; but in the months following March there

Tons of Cargo Carried by Commercial Vessels Passing Through the Panama Canal from its Opening to June 30, 1921, by Fiscal Years.

Nationality.	1915.	1916.	1917.	1918.	1919.	1920.	1921.	Total.
Belgian					464	406	12,709	13,579
British						5,916	6,700	12,616
British	2,200,514	1,570,660	3,393,750	2,615,675	1,876,939	2,830,268	3,738,257	18,228,062
Chilean	50,879	51,573	184,446	153,259	161,340	104,738	61,737	709,972
Chinese						13,700	14,400	28,100
Colombian			3,069	2,091	1,137	27	2,112	8,409
Costa Rican			2,730				1,200	3,930
Cuba								
Danish	116,603	94,950	247,567	420,063	325,277	42,533	322,059	1,564,052
Dutch	26,402	61,859	314,203	233,063	119,297	129,442	216,488	1,099,854
Ecuadorian						72		72
Finnish							7,101	7,101
French	13,600	7,178	36,680	159,859	246,812	125,249	132,836	762,212
German						59,239	73,637	132,076
Greek				5,411	8,301			14,002
Honduran		321						321
Italian	900		5,700	13,703		63,441	47,980	131,522
Japanese	42,600	117,780	446,358	407,399	503,427	726,334	736,617	3,062,519
Jaro-Slovak								8,325
Mexican			27,545	253	142		3,765	29,725
Nicaraguan	6							6
Norwegian	166,522	229,365	597,581	1,090,823	577,679	404,323	637,867	3,704,183
Panama		135				872	1,500	2,507
Peruvian	8,202	62,210	159,609	143,344	121,521	119,418	162,173	719,829
Portuguese						10,775		10,775
Rumanian	21,030	24	3,230	7,036	8,340	12,967	11,343	62,893
Spanish			71,040	35,794	101,563	143,078	361,160	351,560
Swedish	53,292	47,236	94,315	132,521	143,516	74,244	128,919	674,241
United States	2,187,904	848,857	1,475,725	2,094,277	2,758,806	4,547,140	5,163,025	19,079,814
Totals	4,888,454	3,064,114	7,058,563	7,532,031	6,916,621	9,374,499	11,990,214	50,463,496

was a distinct decline, a part of the general business and marine depression over the world.

The extent of this decline in the canal traffic, and of the recovery in August, is indicated in the following summary of the traffic through the canal in the past six months:

	1921	No. of ships
March	255	
April	227	
May	210	
June	192	
July	206	
August	236	

In June, 1921, the tolls were lower than they had been for any month for a year preceding; in June, 1920, the tolls amounted to \$711,159.19, and they have never since been less than that. In tons of cargo carried through the canal, June, 1921, was the lowest month since November, 1919, when the aggregate cargo was 575,480. July showed a distinct increase, and the traffic in August was about as great as that in October and November of last year.

January, 1921, Leads

On the basis of the number of commercial ships making the transit, the traffic in August, 236 ships, was less than the average a month during the fiscal year ending June 30, 1921, in which 2892 vessels made the transit, an average of 241 per month. The vessels in August, however, were more than the average per month for any other period of twelve months since the opening of the canal. The month of most ships

and greatest quantity of cargo in the history of the canal was January, 1921, with 279 commercial vessels and 1,177,052 tons of cargo.

March, 1921, exceeded January in tonnage of vessels and in the tolls earned.

The increase of August traffic over

	Canal net tonnage	Tolls	Tons of cargo
March	1,112,818	\$1,105,536.55	1,084,563
April	955,503	927,977.09	907,613
May	864,617	835,882.77	792,735
June	761,477	751,964.12	694,720
July	804,613	804,503.11	708,982
August	965,276	955,380.78	839,273

the preceding months was due in part to the heavy grain shipments from the West Coast of the United States and Canada. Out of a total of 120 vessels passing through the canal from the Atlantic to the Pacific, 44 were bound to ports on the West Coast of the United States and Canada, many of them in ballast; and of 116 vessels transiting the canal from the Pacific to the Atlantic, 51 had sailed from ports of western United States and Canada, carrying principally grain, canned goods, and lumber.

Shipments of Grain

Between January 1 and August 31, 1921, wheat shipments through the Panama Canal from Pacific to Atlantic aggregated 565,058 tons. They were heaviest in July (99,267 tons) and lightest in April (39,108 tons). The United States contributed 506,583 tons to the total, Canada 3509 tons, Australasia 36,437 tons, South America 13,648 tons, and the Far

East 4890 tons. Barley shipments during the same period aggregated 200,788 tons, of which 173,827 tons originated in the United States, 26,934 tons in South America, and 27 tons in Australasia. Shipments of oats totaled 27,511 tons, of which 18,842 were from South America, and 8669 tons from Australasia. All of this grain was consigned to European ports.

Growth of Coastwise Trade

The rapid growth of the United States coastwise trade through the Panama Canal during recent months is indicated by a comparison of the statistics for the period of eight months from January 1 to August 31, 1921, with those for the calendar year 1920:

Period	Atlantic to Pacific Ships	Cargo tons
Calendar year 1920.....	116	416,819
Jan. to Aug., 1921....	141	569,300

Both the number of ships and the cargo tonnage were greater during the first eight months of the current year than during the entire year 1920.

Crude Oil Cargoes

During the calendar year 1920, 828,223 tons of crude oil was shipped from the Mexican oil fields through the Panama Canal to the West Coast of North and South America. During the first six months of 1921 crude oil shipments aggregated 684,227 tons. This is equivalent to a monthly average of 114,038 tons. But in July the crude oil tonnage dropped suddenly to 14,491, and the August shipments amounted to only 36,454 tons.

It is understood that this sudden decline resulted from the imposition of a higher export tax on Mexican oil, and that rather than pay the tax certain companies temporarily stopped their shipments.

Briefs

The Shipping Board 535 Empire State, operated by the Pacific Mail, arrived at San Francisco September 24, having made the voyage from Yokohama via Honolulu in 12 days, 19 hours and 40 minutes. This voyage broke the Golden State's record of 13 days, 7 hours and 48 minutes. The Empire State made the run from Yokohama to Honolulu in 8 days and 40 minutes, also a new record. She was built by the New York Shipbuilding Corporation.

The purchase of a 7500-ton ocean freighter by the Taiyo Kaiun Kaisha (Ocean Transport Company) in Germany, and the fact that it is said to be negotiating for other vessels,

have led to reports that the company will resume some of its old offshore services.

Crowell & Thurlow, New York, have placed four 9600-ton vessels in the intercoastal trade under the Sea Carriers, Inc., Intercoastal Lines (I. S. C.); Houlder, Weir & Boyd are New York agents. Struthers & Dixon acted as general Pacific Coast agents for the first two vessels and thereafter withdrew. The I. S. C. is reported to be cutting conference rates greatly.

Norton, Lilly & Company will act as general agents on the Pacific Coast for Ellerman's Wilson Line, which will operate a service between

Pacific to Atlantic Ships	Cargo tons	Total Ships	Cargo tons
122	644,833	238	1,061,652
123	634,203	264	1,203,503

the Pacific Coast and Europe. Norton-Lilly also will represent the Federal Steam Navigation Company, which will send at least two large freighters to the Pacific Coast this year. These ships will have large refrigerator capacities.

Frank Waterhouse & Company, Seattle agents of the Furness-Prince Europe-Pacific service, will act in San Francisco also, with headquarters in the Oceanic building.

The California Steamship Agency has been formed at Los Angeles by J. McMillan, manager of the Los Angeles office of Swayne & Hoyt, and by W. S. Wheaton and Charles F. Kruger. The company will act as agent of the Clan Line and Swayne & Hoyt's Pacific-Argentine-Brazil and Pacific-Caribbean-Gulf lines.

A. C. Stubbe, formerly manager of the Columbia-Pacific Shipping Company, and William H. Lyng head a syndicate that has purchased the Northwest Shipping Company, Portland, Oregon.

A radio compass station at Fort Stevens, Oregon, has been placed in operation.

The Luckenbach steamship Edward Luckenbach arrived at San Francisco October 12 after a voyage from New York of 15 days and 11 hours steaming time and 18 days elapsed time. She sailed from New York at 8 p. m. September 24 and arrived at Panama 4 p. m. September 30, 5 days and 20 hours out. She sailed from the canal at 5 p. m. October 1 and arrived at Los An-

geles at 3 a. m. October 10, 8 days and 13 hours from Panama and 14 days and 9 hours steaming time from New York. She departed from Los Angeles for San Francisco at 3 p. m. October 11 and arrived at 5 p. m. October 12.

An international shipping conference will be held in London November 23, 24 and 25. Among the questions to be discussed will be standardization of charter parties and bills of lading, limitation of shipowners' liability on bills of lading, an international understanding with regard to the carriage of deck cargoes of wood, adoption of an international load line policy, an agreement on the construction of bulkheads with a view to greater safety of passengers and crews.

A new radio compass station has been placed in operation by the Navy at Tatoosh, at the entrance to Puget Sound.

Pacific Port Charges

Charges at various ports of the Pacific, as summarized and upheld by the intercoastal conferences, follow:

San Diego (Ordinance No. 5856)—Wharfage, 10 cents a ton; handling charges, merchandise not otherwise specified, 60 cents a ton.

Los Angeles—Wharfage, merchandise not otherwise specified, 10 cents; at the outer harbor, 12½ cents; handling charges, 60 cents.

San Francisco (Tariff No. 2)—State toll charge of 15 cents a ton on foreign and intercoastal business; handling charge of general, N. O. S., 52 cents; iron and steel, 40 cents.

Oakland—Wharfage, 10 cents; handling charge, San Francisco rates apply.

Portland (Tariff No. 5)—Wharfage, 25 cents in, 30 cents out; handling charge, 60 cents both in and out (applies at Municipal Terminal).

Seattle (Tariff No. 1)—Wharfage, 30 cents; handling, 65 cents; transshipment rate, Seattle to Bremerton, 10 cents a hundred pounds; wharfage and handling rate, 75 cents at each end.

Tacoma (Tariff No. 2)—Freight not otherwise specified, wharfage, 25 cents; handling charge, 60 cents.

Victoria—Wharfage charges, general merchandise, 60 cents; handling charges, ship slings to warehouse or vice versa, 75 cents; cost of discharging general cargo, 54 cents; loading, 59 cents.

Vancouver, B. C.—Wharfage merchandise, 60 cents; loading and unloading general merchandise, N. O. S., to dock, 75 cents; to cars, 85 cents.

Marine Insurance

CHARLES F. HOWELL
Eastern Contributing Editor

Foreigners as Settling Agents

American marine underwriters are decidedly encouraged by the increasing spirit of co-operation that has been manifesting itself among them during the last twelvemonth, but many of them feel that this get-together attitude could be advantageously manifested still further if some concerted action were to be taken in the very important matter of installing Americans in the place of foreigners as settling agents of our companies in other countries. Trade secrets are, it is well known, falling into competitive hands through the employment of other nationalities than ours in this vital particular. It is at present the rule rather than the exception to have American underwriters represented at foreign ports by men of that nation, and too often they are merchants, trained in insurance, it is true, but also actively interested in mercantile pursuits of their own country. The result is that such a settling agent is frequently the competitor of the consignee who is buying American goods, and by reason of the secrets secured through his insurance connections he is in a position to take advantage of the American shipper and his foreign customer. This opportunity is particularly open to him when handling claims for damaged goods. In order to prove his claim the consignee must file with the settling agent of the American underwriter a full set of documents, including the invoice. Through the invoice the settling agent obtains complete information about the prices and terms of the sale, and this knowledge he can, and frequently does, communicate to his principals at home, thus enabling them to undersell the American shipper. If the American exporter is to compete on equal terms with his foreign rivals this condition must be corrected. The men who are being sent abroad by our foreign trade institutions are, unfortunately, not equipped to handle insurance matters. The question naturally follows: are our marine insurance companies in position to afford the establishment of American-filled settling agencies throughout the world? It would seem that one way out of this dilemma would be through co-operation among themselves, and securing the support of the banks and steamship companies, to the end that the men

who are sent out are seen to be capable of adjusting marine losses and of handling the details of general insurance transactions.

Hazards in Foreign Credits

Sellers in this country are frequently obliged to extend long-time credits to foreign purchasers on account of prevailing conditions abroad. This often means that goods are held in storage at foreign ports pending the taking up of the draft by the buyer. American underwriters have to work in the dark when they cover these stored goods, as they are without information as to the types of warehouses employed and as to the fire hazards incurred. Marine insurers feel that goods in long-time storage are more properly subject to fire underwriters' consideration, and yet they are anxious to stand behind our exporters in the effort to build up a foreign trade. With the close of the war came a wholesale repudiation of contracts and enormous quantities of goods were left on shore in foreign countries unprotected by insurance because the underwriters declined to extend their policies to cover for an indefinite period. This attitude was scored by the banks as "arbitrary and unfair." And yet it would seem that the underwriters were entirely justified in the stand they took, because a general extension of their covers would have made them liable for enormous values in little known and, in many instances, unprotected locations. Indeed, the banks themselves were chiefly to blame for that situation, due to their lack of foresight in extending credits to foreign buyers without taking into consideration the probable effects of the termination of the war. In a word, it was much more a credit question than one of underwriting; and as the banks were responsible in a large measure for the state of chaos that ensued it was entirely proper that they should be expected to bear the consequences. But now, however, the situation is materially different, and underwriters are in a position to weigh the various influences surrounding each risk and to take such steps as may be necessary to protect themselves. It is through co-operation in all our foreign trade agencies, and through nothing less, that we can hope to make adequate progress in the building up of our foreign trade.

A Leak-proof Barrel

Any improvement in containers is a matter of serious interest to marine underwriters, and consequently it is natural that they should receive with satisfaction the news that an inventive member of Lloyd's, London, by the name of Kenward, has perfected a barrel that appears to be absolutely proof against leakage. It is said to have stood up admirably under recent exhaustive tests. Its capacity is 40 gallons, and it is made in two sections, sealed by a flexible band at the joint when filled, but capable of being nested and packed in a small space when empty. It is constructed of steel sheets, and is 35 inches long, 24½ inches in diameter, and 18 inches across the ends. In the severe test to which it was submitted it was filled to within five gallons of its capacity and then slung to a height of 90 feet on a crane and lowered in a series of violent jerks. Next it was dropped from a good height into the quay; but despite this rough treatment no leakage developed. It now remains to see whether it will stand a rough voyage as successfully as it did its land tests, and should this transpire it will doubtless revolutionize the insurance rates on leakage. Already British underwriters are quoting reduced rates on liquids shipped in the Kenward barrel.

Court Decision on Exchange

The exchange muddle has been cleared up by a decision rendered a few days ago by former Judge Clarence J. Shearn of New York, acting as arbitrator in the case of the Liberty Commerce Corporation against R. A. Corroon & Co. According to this finding you may arrive at the proper liability by dividing the losses in dollars by the rate named in the clauses. Judge Shearn argued that insurance companies should not be exposed to losing through fluctuations in the rate of exchange, which is something they could not possibly measure in advance. It would be both dangerous and unsound for insurance companies to speculate in exchange, thus jeopardizing their solvency. Said he in conclusion: "Reckoning the loss should not be left to the fluctuating exchange, the nearest approach to protection for the insured is to stipulate that the loss shall be adjusted at the rate of exchange fixed in the contract, that being the rate prevailing at the time the policy was written. . . . It is entirely clear that under the stipulated facts the proper method by which to compute the loss is to

take the number of dollars represented by the goods destroyed, divide by the stipulated rate of exchange, and thus determine the number of pounds due from the underwriters." This is regarded as an important victory for marine insurance companies, especially for those located in other countries and for their brokers here who negotiate the coverage.

"Received for Shipment"

Underwriters are in receipt of the second interim report of the British Chamber of Shipping and Pilferage, and it throws an interesting light upon one aspect of the phrase "received for shipment," which is occasionally used in bills of lading in place of the more familiar term "shipped in apparent good order and condition." The following recommendation is made by the committee of the chamber: "The custom of issuing bills of lading for goods received for shipment, except where the circumstances make no other form appropriate, should be discouraged, as it gives scope for pilferage, and in no case should shipowners, under whatsoever pressure from merchants, issue a 'shipped' bill of lading until the goods are on board the steamer, as the difficulties of protecting the steamer against claims for pilferage which may have happened before shipment are thereby greatly increased."

The "Series" Clauses

Brokers complain that the insured is at a disadvantage in the employment of the so-called series clauses, and perhaps a word or two might be written to good purpose in explanation of this method. These clauses are principally used in connection with the insurance of commodities in bags, such as flour, sugar, etc., and provide for a percentage of average on each series of 25, 50 or 100 bags. Their purpose was to relieve the underwriter from paying such small claims as are involved in granting average on each package, as in many instances the bagged commodity is worth only \$10 a bag, which, under a 3 per cent average clause on each package, would mean a claim if the damage amounted to 30 cents. Unfortunately, under prevailing methods employed in discharging cargo, it is practically impossible in event of a damage to determine to what series the damaged bags belong. It is customary to separate the damaged sacks from the sound as they come out of the ship, and when the vessel is unloaded the damaged bags are in one pile and the sound ones have either gone forward or are held on the

dock in a separate pile. The consequence is that the insured is at a disadvantage if the underwriter insists upon proof that the stated percentage of average has been attained on each series, because there is no means of securing such proof. The better method, for both underwriter and insured, is to make use of a clause that provides a minimum loss on the shipment of, say, \$100 or \$150, depending on the value of the insured cargo. With such a clause it is merely a question of determining whether or not the loss amounts to the required amount; if it does the underwriter is liable; if not, there is no liability. C. F. H.

The Bayard-Beaver Case

Judge M. T. Dooling, United States District Court, San Francisco, has handed down an interesting decision in the Bayard-Beaver case. The suit was for demurrage for delay caused by a collision, liability for which was admitted by the San Francisco & Portland Steamship Company, owner of the Beaver. Despite the admission of liability in the case, however, Judge Dooling denied demurrage because Olson & Company, managing owners of the Bayard, had refused to charter another vessel, the Brazil, at Shipping Board rates, and the judge held that this fact signified that the Bayard also would have been idle even though undamaged. The decision should be of much interest to nations that were neutral during the war, belligerents not being concerned greatly, if at all.

Judge Dooling's decision follows in full:

IN THE SOUTHERN DIVISION OF THE UNITED STATES DISTRICT COURT, FOR THE NORTHERN DISTRICT OF CALIFORNIA, FIRST DIVISION, IN ADMIRALTY.

Aktieselskapet Bonheur, a corporation, Libellant,

vs.

American Steamer Beaver, her tackle, etc., Respondent;

San Francisco & Portland Steamship Company, a corporation, Claimant.

No. 16303

Nathan H. Frank, Esq., and Irving H. Frank, Esq., proctors for libellant. Farnham P. Griffiths, Esq., and McCutchen, Willard, Mannon and Greene, proctors for respondent and claimant.

The Bayard and the Beaver collided in the harbor of San Francisco on November 3, 1917. The respondent Beaver admits liability for the collision and the only question left for determination is the question of damages. The cost of repairs to the Bayard must, of course, be allowed. The fact that other repairs, not nec-

essitated by the collision, were made, but which did not delay the completion of repairs so necessitated, is, as I view the case, immaterial. The period covered by the making of the repairs was forty-eight days. It would, however, in any event have taken at least two weeks to have arranged for the acceptance by the owners of a charter satisfactory to the Shipping Board. The Brazil, a ship of the same general type as the Bayard, entered San Francisco harbor on November 13, 1917, ten days after the collision, and remained there idle until the middle of January, 1918. During all of this time Olson & Company, of Norway, were the managing owners of both the Bayard and the Brazil. Moore & Company had offered a lump sum of \$400,000 as charter hire for the Bayard for a voyage to the Orient and return, and it is on this offer that libellant bases its claim for the amount of damages sought as demurrage. But it is quite clear that a charter at that rate would not have been approved by the Shipping Board, which had fixed a basic rate of 45 shillings per deadweight ton per month. While the Bayard was laid up for repairs the Brazil was also idle in port, although there was a great demand for ships and she could have sailed at any time at the rates fixed by the board. The fact that she did not do so leads me to the belief that the owners were unwilling to accept those rates, and preferred to wait in the hope or expectation of securing a more profitable figure. They were in fact unwilling to accede to the regulations of the Shipping Board in regard to rates, and seemingly desired to take their chances of getting higher rates later by leaving the ship idle during this period. If it were not for the voluntary idleness of the Brazil I would allow demurrage to the Bayard at the rate of 45 shillings per deadweight ton per month for the period of 34 days. But as the owners preferred to leave the Brazil idle when she could have been chartered at those rates, it is reasonable to conclude that they would not have accepted them for the Bayard had she been in commission. A higher rate would not have been approved by the board.

A decree will be entered in favor of libellant for the amount expended in making the repairs rendered necessary by the collision. If the parties do not agree as to this amount, the cause will be referred to the commissioner to ascertain and report the same.

Salvage Association Functions

The following statement has been issued by the American marine insurance syndicates:

At a special meeting of the board of managers of the American marine insurance syndicates held on

FIREMAN'S FUND

Insures Hulls, Cargoes,

HEAD OFFICE: CALIFORNIA AND SANSOME

JOSEPH HADLEY, European Agent
1 LOTHBURY, E. C.
LONDON

E. A. VALENTINE, Special Agent
714-715 BOARD OF TRADE BUILDING
PORTLAND, ORE.

FRANK G. TAYLOR, GENERAL AGENT FOR WASHINGTON, OREGON, ALASKA

Tuesday, October 18, steps were taken to transfer the organization and business of Syndicate A to its successor corporation, United States Salvage Association, Inc. The salvage association, the entire capital stock of which is held by the subscribers to Syndicate A, is a non-profit-making organization, designed to provide for the American shipping trade a service which shall be the counterpart of that furnished to the British shipping trade by the famous Salvage Association of London. It will have agents throughout the world and, in fact, through its arrangement with Syndicate A, will at once be provided with carefully selected agents at many of the leading ports. It also takes over the present American organization of the syndicate, which has established its own offices in Boston, Philadelphia, Baltimore, Norfolk, Savannah, New Orleans, Galveston and San Francisco, with its principal operating office in New York. The surveying staff of the salvage association will be headed by W. C. Foley, as chief surveyor, and J. A. Wilson, as deputy chief surveyor. The officers elected at the organization meeting are Benjamin Rush, president; Walter Wood Parsons, vice-president; Gomer H. Rees, secretary, and Charles B. Page, general manager. The salvage association will commence active operation on November 1, on which date Syndicate A will withdraw.

Page Joins Fireman's Fund

Announcement has been made in New York by J. B. Levison, president of the Fireman's Fund Insurance Company, that F. H. & C. R. Osborn have resigned as managers of the Atlantic marine department effective December 31 and will be succeeded by Charles R. Page, manager of Syndicate A.

Mr. Page entered the employ of the Fireman's Fund in June, 1902, after being graduated from Yale.

He resigned early in 1906 to enter the service of Hind, Rolph & Company, San Francisco, but rejoined the Fireman's Fund in July of the same year, became general auditor in February, 1915, and remained with the company until he went to the Shipping Board in 1918. After the war he became treasurer of the Atlantic, Gulf & West Indies Line; next was vice-president of the Clyde & Mallory lines; and left that position to manage Syndicate A.

Japanese Loadline

An announcement was made by the Japanese Department of Communications September 12 to promulgate regulations for the application of the loadline law and the rules of the loadline as preliminary to enforcement of the law passed by the forty-fourth session of the Diet, says the Japan Advertiser. The former consists of seven chapters and sixty articles, while the latter consists of sixteen chapters and 104 articles. On the whole, the new enactments were formulated on the basis of regulations promulgated by the British Board of Trade with a view of acting in harmony with the enactments of other governments. It is said that the Japanese government has proceeded to negotiate with other countries on mutual recognition of the laws affecting the waterline of their craft and approval has been obtained from a certain country. It is expected that with the enforcement of loading law, all the vessels arriving in the Japanese ports should bear a lawful loadline mark in conformity with Japanese enactments and considerable difficulty is expected on this point. But those ships that have Plimsoll mark from Lloyd's or other competent associations will be exempted from application of the new Japanese laws. Those craft on which the proposed enforcement of the Japanese loadline law is to be applied will be ships that have no Plimsoll mark granted by the

above-mentioned associations, ocean-going ships and the ships of near sea-service of 500 tons or more now under construction or to be constructed. The total tonnage of this sort of ships is estimated at 1,000,000 tons or more and the total number is approximately 700. It is said the Japanese government expects to complete application of its loadline law on all vessels arriving at Japanese ports within three years after the laws went into effect. The date of enforcement remains to be determined until formal recognition by other governments of the promulgated enactments has been obtained.

In Re Lining

When T. A. Lee, Pacific Coast representative of Furness, Withy and Company, was in Portland, Oregon, late in September in connection with the loading of a wheat cargo in the steamship Mongolian Prince, he bestirred himself in a manner that promises to have a marked effect. Mr. Lee said to the Portland Chamber of Commerce that his company had spent \$4000 lining the hold of the Mongolian Prince and that the expense was altogether unnecessary. The chamber, immediately taking up the point raised, requested the insurance committee to make a special investigation. At this writing its work has not been completed, however, because advices were received that E. L. Woods, secretary of the Board of Marine Underwriters, San Francisco, was conferring with the London board upon the adoption of uniform regulations to apply throughout the world; and the committee chose to await further advices from London before completing its report.

Two Sides of It

Those who hold that lining now is unnecessary say that the requirement is a heritage from old sailing ship days, when vessels were at sea for a long time and were exposed to moist tropical airs. To this statement surveyors retort that the rules

INSURANCE COMPANY

Freights and Disbursements

STREETS, SAN FRANCISCO, CALIFORNIA

W. H. WOODRUFF, Special Agent
LOS ANGELES
238 BYRNE BUILDING

F. H. & C. R. OSBORN, Managers
ATLANTIC MARINE DEPARTMENT
72 BEAVER STREET NEW YORK

AND BRITISH COLUMBIA, 309 COLMAN BUILDING, SEATTLE, WASHINGTON

have been modified since sailing vessels took most of the West Coast grain cargoes around the Horn and that lining remains necessary if damage is to be prevented.

Perhaps the best statement of the owners is that of T. Morimoto, of the New York office of Suzuki & Company, who is quoted as follows in the Portland Oregonian:

I inspected the holds of a steamer that had just finished lining for sacked wheat. There was much more lumber used than is required on the Atlantic and Gulf coasts by the New York Board of Underwriters. At Galveston the average cost of lining and loading a standard 9400-ton steamer is about \$2500. I understand that it costs \$1600 here to line merely the 'tween-decks. This cost is out of proportion.

Safety Primary Consideration

Another thing to consider about the cost of lining ships is that lumber good enough for this purpose can be bought at Portland for \$12 a 1000 feet. At Galveston this same grade of lumber costs around \$16 per thousand, so the lining cost here should be less than on the Atlantic and Gulf coasts. Labor costs are practically the same, except here you have liners who are specialists, while at the southern and eastern ports the longshoremen do the lining.

The safety of the vessel is the only reason for lining. When you have taken the necessary precautions to keep the wheat out of the bilges and to prevent the cargo from shifting you have done all the lining that is necessary to assure the seaworthiness of the vessel, and that is all that ought to be required.

Japanese Seek Support

In spite of the slight improvement in the marine insurance business due to somewhat increased shipments, marine insurance companies generally are still suffering from the depression, and it is said that some of the minor companies are faced with closing down or being merged into larger concerns, says the Japan Advertiser, Tokyo.

Before the European war there were only five companies exclusively engaged in marine insurance. These were the Tokio Kaijo, Kobe, Teikoku, Nippon, and Toyo. Besides, four companies undertook marine insurance in addition to fire and other kinds of insurance. There were thus only nine marine insurance companies before the war, but the wartime prosperity in shipping and foreign trade caused many new marine insurance companies to come into being. Indeed, such companies numbered no less than 35.

Large War Business

During the war there were brisk shipping movements, while the construction of new vessels in this country amounted to 600,000 or 700,000 tons a year. In the circumstances all the marine insurance companies did a very good business by insuring cargo and hull or by undertaking reinsurance. But not only have shipments since greatly decreased, but the output of tonnage shows a marked falling off, there being almost no new orders for merchantmen. The number of tied-up ships has somewhat diminished of late, but the present improvement in shipping is confined to particular lines, and the freight market continues depressed, taken as a whole. While hull insurance has decreased, it has become more dangerous, because of the increase in accidents at sea.

Small Companies Have Trouble

These factors have been combined to make the position of marine insurance companies difficult. The first-class companies which have existed since before the war are on firm ground and are able to sustain the strain, but this is not the case with some of the smaller concerns which were established during the war. Smaller companies are doubly hit, because shippers and shipowners naturally prefer to effect insurance with larger companies. Even of the

smaller companies, those which have special relations with more substantial concerns have greater facilities for holding their own, but those which stand alone helplessly find themselves compelled to face extinction or seek absorption by other companies. Where there is hope for holding out if assistance is obtainable, efforts are being made to contract special relations with concerns that are stronger financially.

Thus the Teikoku and the Toyo have special relations with the Tokio Kaijo, the Nisshin and the Nitto with the Kobe Kaijo, the Settsu with the Osaka, the Yachiyo with the Nisshin, the Tokiwa with the Chiyoda, the Dai Nippon with the Kyoda, and the Daito with the Nippon. It is said that this method of tying over the difficult situation is advisable for the marine insurance business of the country as a whole.

Alaska Wreck Decision

Inspectors Frank H. Turner and Joseph P. Dolan, United States Steamboat Inspection Service, San Francisco, have returned a decision placing the entire blame for the loss of the steamship Alaska on Captain Harry Hobe, who went down with the vessel, and exonerating William E. McClintock, first officer; Earl Du Pree, second officer; J. P. Heikkila, third officer, and M. J. Albin, fourth officer. Sections of the decision bearing on Captain Hobe's responsibility follow:

... The Alaska ... left Portland, Oregon, at 11 a. m. on August 5, 1921, via Astoria, leaving Astoria at 3 p. m., same date, bound for San Francisco, California, in command of Captain Harry Hobe, who, after crossing Columbia River bar on August 5, 1921, at 9 p. m., took his departure from the lights and set his course for Cape Blanco, distant 201 miles, which was not sighted, owing to the fog. When he had run his distance, he estimated his bearing as being from 5 to 10 miles off Cape Blanco and changed his course,

which he altered to SE by $S\frac{1}{2}S$, to pass Blunt's Reef lightship, $2\frac{1}{2}$ miles off, a distance of 143 miles from Cape Blanco, but took no soundings. At 6:26 p. m. on August 6, without taking a cast of the lead, his course was changed to south, and 49 minutes later she struck Blunt's Reef. In fact, from the time the Alaska took her departure from the Columbia River lightship on August 5, 1921, until she struck Blunt's Reef, no cast of the lead had been taken. About 9 p. m. the man on the lookout reported a whistle ahead (which, no doubt, was the fog whistle on Blunt's Reef lightship). At this time the master ordered Earl Du Pree, the second mate, who was with him on the bridge, to aloft to listen for the whistle and look for the light. The second mate reported the whistle again to the captain. Immediately thereafter, at about 9:15 p. m., while the second mate was still in the rigging, the vessel running full speed, struck the reef, which proved to be the westerly group of rocks forming Blunt's Reef. The wreck bears 269 degrees true, 700 yards distant from the most westerly rock of the reef in 13 fathoms of water, and from the lightship N. 58 E. true, distant $1\frac{1}{2}$ miles. . . .

After careful consideration of the evidence adduced at the trial, it is positively shown that Captain Hobe was responsible for the loss of the steamer Alaska through his negligence in navigating his vessel full speed in a dense fog without taking soundings, and it is the painful duty of this board to place the responsibility upon the master, Captain Harry Hobe, who was in charge of the bridge when the vessel took the rocks, for not slowing or stopping and using the lead, which was his duty to do in order to confirm his position. Had he done so and taken a cast of the lead at 8:26 p. m. when a whistle was reported ahead, and at which time he changed his course, this accident would not have occurred. Also, as a ship's master, he should have had knowledge of the unreliable and erratic nature of the currents off the California coast, and in shaping his course from Cape Blanco to Blunt's Reef lightship, due regard should have been given to a possible inshore set and allowance made therefor. Secondly, as he expected to be in the vicinity of Blunt's Reef lightship at about 9 p. m. as testified to by the second mate and the chief engineer, and knowing he was on soundings, one cast of the lead would have shown him that he was inside of the 35 fathom curve; and lastly, had he stopped his ship when he heard the whistle and by timing the sound, determined beyond a doubt that it was Blunt's Reef lightship on his starboard bow, he would have cleared the reef. The Alaska had no submarine bell receivers nor did she have any radio communication with the shore, regard-

ing bearings, though she was equipped with wireless.

1920 Hawaiian Business

For the calendar year 1920, insurance companies doing a marine business in the territory of Hawaii have reported to the insurance commissioner totals of \$257,298,093.96 in business written; \$678,024.58 in premiums received, and \$56,254.21 in losses paid. The commissioner's preliminary report, from which these figures are taken, does not list losses incurred; nevertheless, the showing must be eminently satisfactory to every company concerned.

The aggregate of all insurance written in the territory in 1920 was \$368,141,575.29, more than two-thirds of which was marine; the aggregate of premiums, all forms, was \$3,662,671.96; plus \$1,408,146.66, life renewals; and all losses paid, life included, aggregated \$1,121,031.05. The volume of business written increased \$145,030,082.69 over 1919, probably because of the great value of sugar in the 1920 season, and losses increased \$319,298.69.

Marine business of 1920 is shown in the following table:

Name of Company	Insurance written	Premiums	Losses Paid
Aetna	\$ 218,419.97	\$ 56,410.34	\$20,422.03
American and Foreign	322,886,960.00	69,855.48	3,526.88
Alliance	15,618.00	243.09	13.22
Automobile	101,769.00	1,136.49	690.20
British and Foreign	158,123,389.94	49,408.40	2,182.61
Canton	2,698,959.00	3,011.70	4,189.67
Fireman's Fund	18,760,169.00	24,400.66	27.48
Great American	2,680,319.00	12,747.69	.....
Home (New York)	450,970.00	3,112.47	334.86
Hartford	7,307,276.00	34,159.17	2,827.07
Ins. Co. of N. America	65,424,996.78	163,921.76	6,452.22
New Jersey	140,170.00	7,970.47	5,865.18
National Union	773,787.00	1,753.83	.....
Norwich Union	913,020.00	9,797.53	130.76
National Liberty	697,700.00	11,897.15	.....
Phoenix	8,448,040.00	15,445.22	12.13
Queen	17,700.00	169.69	.....
Switzerland General	55,783,323.00	140,270.26	6,086.56
Tokio	933,801.26	5,875.01	65.66
Thames & Mersey	1,330,239.00	43,733.93	2,336.39
Union Marine	7,906,189.98	24,704.24	1,091.29
Totals	\$257,298,093.96	\$678,024.58	\$56,254.21

Pacific Briefs

The Todd Drydocks, Seattle, received a contract for repairs to the American-Hawaiian steamship Arizona, which struck a ledge off San Juan Island, Puget Sound, in a heavy fog October 4. The Todd bid was \$42,900. Ten plates on the starboard side abaft of the engine-room were torn. Two large holes were ripped in the starboard bilge, the oil-tanks being punctured.

Something of a novelty on the Pacific Coast, to-wit, rain insurance, recently was placed by the C. H. Williamson Company, San Francisco, with a New York company, covering all the baseball games of a winter league. Policies of this nature are appealing more and more; although they have been largely confined to open-air gatherings, business houses that would be adversely affected by an untimely rain are beginning to show interest.

During the third week of October, with the threatened railroad strike a week or more distant, there was some little inquiry regarding protection, but few or no policies were being written so early. Rates depended upon the individual company's own opinions, just as was the case with war risk; in general, however, it appeared that the opening rates would be from one-fourth to one-half of 1 per cent, the latter being for a blanket policy.

At the end of June, 1921, the Tokio Marine & Fire Insurance Company had yen 6,884,930,000 written

on marine risks; yen 2,534,500,000 on fire risks; yen 1,700,702,000 on transportation, and yen 65,847,700 on automobile, says the Japan Times. This great business was being done on a capitalization of yen 15,000,000, although the company proposes to double its capital.

Profits for 1920 were yen 9,116,100, this sum including yen 7,500,000 carried over from the preceding year, however.

Shipbuilding

Vessels Planned

Regarding rumors of new construction for the Matson Navigation Company, an official said that tentative data were being assembled but that no statement could be made as to the details of design or when building would begin. The company was not in a position, he continued, to make public any plans it might have in connection with the Philippines trade, provided that President Harding decided that adequate services under the American flag existed on or before February 1. In the various rumors that have been heard new construction and the Philippines trade are closely connected.

Reports from the East are authoritative for the statement that the Merchants & Miners' Transportation Company of Baltimore will have designs drawn for a combination vessel. Preliminary plans for a 200-foot day passenger boat for the Hudson River Day Line are reported to have been drawn.

The San Francisco & Portland Steamship Company is reported to have had plans drawn for the construction of three steamships for the Pacific coastwise trade. Each will have accommodations for 275 cabin and 100 steerage passengers and will make about 17 knots an hour.

New Repair Firm

Pacific Coast shipbuilding and ship-repairing circles were greatly interested in the announcement made during October that George A. Armes, former president and general manager of the Moore Shipbuilding Company, recently resigned, had joined the firm of Mooney & Young, San Francisco. Within a few days after this first announcement came another to the effect that the three had incorporated the General Engineering Company, with Mr. Armes as president; J. F. Mooney as vice-president and general manager, and James Young as secretary and treasurer.

The company intends to expand as rapidly as conditions justify, said Mr. Armes. He withheld any statement as to plans for a drydock, but said that for the time being arrangements were in effect with the Crowley and Barnes & Tibbitts interests, San Francisco, for the docking of vessels up to 5000 tons gross, and that, when the new marine railway of the Hanlon yard, Oakland, was completed, vessels up to 12,000 tons gross would be docked there. The equipment of the Triangle Engineer-

ing Company, San Francisco, has been bought outright by the General Engineering Company.

Mr. Mooney formerly was superintendent of Skinner & Eddy, Seattle, and Mr. Young was his assistant. Both were with the Hanlon yard for a few months after the closing of Skinner & Eddy.

A New Drydock

Reports from Vancouver say that J. Coughlan and Clarence Wallace, shipbuilders of Vancouver, and the Dominion government have concluded negotiations for a subsidy for a drydock to be constructed at Burrard Inlet and that the Burrard Drydock Company has been incorporated. The cost of the dock is estimated at \$2,500,000. There has been some complaint recently regarding charges at the Esquimalt dock, N. A. Yarrow, manager of Yarrow's, Ltd., having said that dues had increased 240 per cent since 1919, so that Canadian repair yards were at a decided disadvantage in competing with American.

Changes in the Yards

A new firm known as the Montreal Boatbuilders, Inc., has been established at Lachine, Quebec, to build vessels. Its capitalization is \$100,000. The principal owners are citizens of Montreal.

The Fletcher Ship Repairing Company, Ltd., Levis, Quebec, was incorporated recently with a capital stock of \$500,000, by W. J. Bishop, W. F. Fletcher and other stockholders.

The H. W. Sweet Shipyard & Machine Works, Inc., Greenport, New York, has been incorporated with a capital of \$75,000 by H. W. Sweet, F. B. Corey and C. W. Thorn, to operate a shipbuilding plant and general machine construction and repair works.

The Saginaw Shipbuilding Company, established in 1917 with six building ways, has retired from shipbuilding and has been merged into the Ruggles Motor Truck Company, which will use the Saginaw plant, remodeled. The Newark Bay yard of the Submarine Boat Corporation is doing shore work, such as for theaters, hotels, apartment houses, stadia, tanks, motion-picture theaters, office buildings, etc.

The Maryland Wrecking Company, Inc., Stone House Cove, Curtis Bay (Baltimore harbor), has purchased the Carolina Shipyard at Wilmington, N. C., from the George A. Fuller Company. The purchasers will maintain the yard on a smaller scale.

With the launching of the Standard Transportation tanker Dixie Arrow at the South Yard of the New York Shipbuilding Corporation September 29, all the ways were cleared. The yard is owned by the Emergency Fleet Corporation, but is operated by New York Ship. Four combination vessels and four tankers have been launched at the yard, which was completed at a cost of \$10,000,000 only a short time before the armistice was signed.

The Tank Shipbuilding Corporation has temporarily suspended operations at Newburgh and will entertain proposals for the leasing of the property and equipment. The plant, which was established in 1915, includes two 600-ton marine railways and seven launching ways.

Recent Repair Contracts

Some recent repair and alteration contracts follow:

United Engineering Works, San Francisco, Inter-Island Steamship Mauna Kea, repairs, about \$14,000.

Todd Shipyards Corporation, Robins Plant, Anderson Overseas Corporation steamship St. Louis, reconditioning.

National Drydock & Repair Company, American-Hawaiian steamships Floridian, Ohioan, Panaman, installation fuel-oil heating system, \$12,750.

Todd Shipyards Corporation, Tietjen & Lang Plant, Ward Line chartered steamship San Jacinto, reconditioning, in excess of \$1,000,000.

Same yard, Mallory Line steamship Henry R. Mallory, repairs and installation of auxiliary machinery, \$45,740.

Morse Drydock & Repair Company, Ole Time Molasses Company's steamship Delmira, reconditioning, \$119,650.

Bethlehem Shipbuilding Corporation, Fore River Plant, Furness-Bermuda steamship Fort George, installation oil-burning system, about \$44,000.

Main Iron Works, San Francisco, installation of engines 15½ by 26 by 43-33 and two Main Iron Works water-tube boilers for George E. Billings.

Alterations in Big Vessels

The Shipping Board has approved of alterations to the George Washington and America, the changes in the first case being converting some of the steerage quarters into rooms and in the second converting some of the first cabin into second cabin, at a cost of about \$70,000. The board also is reported to be about to ask for bids for reconditioning the Leviathan, a large vessel of which much has been heard during the last two years. The C. G. M. M.

will install refrigerator space in the Canadian Highlander, the Canadian Scottish and the Canadian Winner, so that they may engage in the Australasian-North American meat trade. The Kidston Company, Montreal, will outfit the Highlander. The Canadian Skirmisher already has refrigerator space.

The Clinton Shipbuilding & Repair Company of Philadelphia has closed with a Mexican company for the construction of some small steel barges to be used for lighterage work in shallow harbors of Mexico. The barges will be knockdown and galvanized throughout.

The General Electric Company will supply auxiliary electric equipment for five Diesel barges recently built by the McDougall-Duluth yard. The equipment will consist of three 10 kilowatt, 400 r. p. m. generators.

Naval Retrenchment Effect

The halt in naval construction, which involves several important yards, should have quite an effect upon costs of construction for private tonnage, inasmuch as plants that are engaged largely or wholly on naval building will seek to hold their organizations intact pending expected resumption of work on men-of-war. On the Pacific Coast the Todd Drydock & Construction Corporation, Tacoma, has three large scout cruisers, Omaha, Milwaukee and Cincinnati, all of which have been launched, and with no private work on hand this yard probably will prove a dangerous contender for whatever offers. Union Plant of Bethlehem is little affected, because its only naval work is submarines.

On the Atlantic the reaction has been greater. The Fore River Plant of Bethlehem has two scout cruisers, a battleship and a battle-cruiser and nineteen submarines, and only two merchantmen, both of which have been launched. Cramp has five scout cruisers, all held up. Newport News will finish its last private work probably next month, but that yard has two battleships and two battle-cruisers, one of which has been launched. New York Ship has the largest volume of commercial work in the country, as well as a battle-cruiser and two battleships, and therefore will not feel the pinch so soon as other plants. Such yards as these will make a spirited effort to get new work before suffering their organizations to disband, unless of course the Washington conference should lead to the definite abandonment of most if not all the vessels now on the ways.

Most of the navy yards also are practically at a standstill.

Wage Reductions

The pay of the Navy Yard employes has been reduced from 13 to 30 per cent, effective in September. About 70,000 men were affected. The department said that reductions were necessary because of a small budget. The Lake Torpedo Boat Company, which had been operating under the Navy scale, adopted the new rates September 19, reducing mechanics to 73 cents and laborers to 41. Canadian Vickers, Montreal, announced a reduction in wages of skilled men from 65 cents to 62½, which followed a former cut from 80 cents to 65. The Federal Shipbuilding Company, Kearny, made effective on September 12 a new scale as follows: mechanics, 70 cents, 66, 62, 58 and 54; helpers, 46 cents, 42 and 40, and laborers, 38 cents, 34 and 30.

On the next day the Texas Steamship Company, Bath, announced a scale of 60 cents, 54 and 48 for first, second and third-class mechanics; 42 and 38 for helpers and 38 cents for laborers. Members of the Charleston Ironmasters' Association have published a schedule of 77 and 72 cents for mechanics; 60, 54 and 43 for helpers, and 38, 30 and 25 for laborers. The New York Shipbuilding Corporation's schedule is being followed by the Philadelphia Ship Repair Company and the Clinton Shipbuilding & Repair Company. The Harlan Plant of Bethlehem has reduced wages another 10 per cent, making the scale approximately 27 per cent below the Macy award. Pusey & Jones have announced a top rate of 58 cents for first-class mechanics with intermediate rates in most crafts. The scale is much the same as that of Harlan. The Greenport Basin & Construction Company reduced all wages October 1, the new maximum for mechanics being 60 cents with intermediate rates in all departments. Laborers receive 40 cents. Additional changes are under consideration by the Atlantic Coast Shipbuilders' Association, Delaware River Section.

In the Wood Yards

The wood yard of Arthur D. Storey, Essex, Massachusetts, has resumed work after reducing wages from 65 and 70 cents to 40 and 50. The George Lawley & Son Corporation, Boston, made effective a nine-hour week on September 8 and announced a new scale of 49 cents to 85 for carpenters and joiners, the averages being 64 for the former and 69 for the latter; 54 to 65 for mechanics, the average being 62; and 44 cents for average helpers. The John H. Mathis Company, Camden, established a new scale October 6. Mechanics are rated at 65 and 60

cents; helpers at 40 and 35, and laborers at 35 and 30. The Noecker & Ake Shipbuilding Company, Camden, reduced wages October 1 to 65 and 60 cents for first and second-class carpenters and to 60 and 50 cents for caulkers. The G. G. Deering Company is paying carpenters 45 cents, with a 5-cent bonus for a few highly skilled men, and is paying laborers 37½ cents.

Ship-painters employed by New York contractors have accepted a reduction of 10 cents an hour, from 70 to 60 for ordinary work, and from 80 to 70 for interior or yacht painting.

World Building September 30

Less than 8 per cent of the tonnage building in the shipyards of the world is being constructed in the United States, according to a statement just issued by Lloyd's Register of Shipping. Of the world total, almost 60 per cent is in the United Kingdom. Returns from the quarter ended September 30 give the total of shipping under construction as 5,542,000 gross tons, of which 3,283,000 tons represents the British portion, 434,000 tons the American, and 1,825,000 tons that of other countries. The British figures, although representing contracts placed for construction, do not represent merely construction on which work is actually proceeding. Included in the British aggregate are 731,000 tons on which work has been suspended and 457,000 tons postponed, a total of 1,188,000, so that the active British shipbuilding program is now 2,094,000 tons. This reduction of more than a third in the work under way is due to the general depression in shipping, and is reflected in the returns from other countries, the total suspensions outside of the United Kingdom being reported as 375,000 tons, or about 10 per cent of the total, Italy and the United States being chiefly affected.

Further Declines Probable

That further declines in the amount of work on hand may be looked for is indicated by the marked discrepancy between the tonnage being turned out and the new construction begun. In Great Britain, for instance, during the past three months, although 306,000 tons of shipping was launched, work was commenced on only 50,000 tons. This is in sharp contrast with the returns issued by Lloyd's Register at the beginning of this year, which showed new construction amounting to 503,000 tons, in comparison with launchings of 576,000 tons.

How sharp the shrinkage in shipbuilding has been since the beginning of this year is indicated by the

decline of nearly 900,000 gross tons in the United States alone, compared with about 425,000 tons for the United Kingdom, and about 325,000 tons for other countries, as the following table shows, the figures representing gross tons:

	Jan. 1, '21	Oct. 1, '21
United Kingdom	3,708,000	3,283,000
United States	1,310,000	434,000
Other countries	2,161,000	1,825,000
World total	7,179,000	5,542,000

Tanker Construction

Even the construction of tankers, which on July 1 showed a decrease of only 18,000 tons from the total at the beginning of the year, has now fallen off markedly, the October 1 figures being 220,000 tons less than those for July 1. The reduction has been greatest in this country, as the accompanying tonnage table shows:

	July 1, '21	Oct. 1, '21
United States	388,868	222,292
United Kingdom	585,980	527,791
Other countries	176,730	181,730
World total	1,151,578	931,813

Although the United States still stands second in the ranking of ship producing countries, American shipyards now have in hand less than 50,000 tons more than the total reported for Italy. No returns are available for Germany.

Small Nations Shift

There have been several shifts in the rating of the smaller shipbuilding nations during the last quarter. Holland, which followed the United Kingdom and the United States in

Compared with the 4,186,000 tons under construction in American shipyards at the first quarter of 1919, which was the world record, today's production in this country is only a little more than a tenth of that total, representing a decline of 3,752,000 tons.

Drop of 2,500,000 Tons

The 5,543,000 tons, representing the total shipping building throughout the world today, is a decline of about 2,500,000 tons from the peak of 8,048,000 tons, attained in September, 1919, or a decrease of more than 30 per cent.

Since the beginning of this year British shipyards have increased their lead over American yards about 500,000 tons, the gap, which at the end of 1920 was 2,398,000 tons, now being widened to 2,848,000 tons.

American Building

The bulletin of the American Bureau of Shipping reports that on September 1 there were 70 seagoing steel vessels of 542,117 gross tons under construction or contract in yards of the United States; 59 vessels of 436,217 tons were for private owners and 11 of 105,900 were for the Shipping Board; the Atlantic was building 48 vessels of 389,079 tons, the Pacific 18 of 125,438, and the Gulf 4 of 27,600. There were 20 cargo vessels of 129,851 tons, 42 tankers of 328,266 tons and 8 combination vessels of 84,000. Only one vessel, a cargo-carrier, was to be exclusively a coal burner; 7 were for either coal or oil and all the others were for oil alone. The following table classifies work according to propulsion:

iramis, built by Union Construction and Southwestern for Anglo-Saxon Petroleum and Dutch Shell. They were the last vessels for foreign account under construction.

Canada delivered one 8350-tonner to the Canadian Government Merchant Marine.

No new contracts have been announced.

The following table shows work as of October 1:

	No. Vessels	Agg'te D.W.T.
American Yards:		
Freighters, U.S.S.B.	2	22,000
Tankers, private	6	67,350
Freighters, private	2	40,000
Totals	10	129,350

	No. Vessels	Agg'te D.W.T.
Canadian Yards:		
Freighters, C.G.M.M.	2	16,740
Comb'n, private	1	600
Totals	3	17,340

Eastern Keel-layings UNITED STATES

Tanker Atlantic Refining Company, Bethlehem Shipbuilding Corporation, Harlan Plant, August 20.

Steelore, ore and oil, Ore Steamship Company, Bethlehem Shipbuilding Corporation, Sparrows Point Plant, July 20.

Eastern Launchings UNITED STATES

Nutmeg Steam, combination U. S. S. B., Bethlehem Shipbuilding Corporation, Sparrows Point Plant, September 17.

B. D. Benson, tanker Standard Oil Company, Oscar Daniels Company, Tampa, September 15.

COAST	RECIPROCATING		TANK
	No. G.T.	No. G.T.	
Atlantic	9 66,851	23 177,426	
Pacific	4 23,400	11 98,788	
Gulf	12 18,231	2 15,600	
Total	25 108,482	36 291,814	
	Pass. & Cargo		
Atlantic			

COAST	TURBINE		TANK
	No. G.T.	No. G.T.	
Atlantic	3 18,000	3 25,600	
Pacific	1 1,250	1 3,250	
Gulf	2 25,000	2 35,000	
Total	6 44,250	6 63,850	
	Pass. & Cargo		
Atlantic			

COAST	NO POWER		TANK
	No. G.T.	No. G.T.	
Atlantic	14 84,431	26 216,428	
Pacific	4 23,400	14 107,418	
Gulf	2 12,000	2 15,600	
Total	20 119,831	42 339,446	
	Pass. & Cargo		
Atlantic			

order at the beginning of July, is now exceeded by Italy and France, Italy's total in hand having increased 87,000 tons during the past quarter, while the total for all other countries fell back. The status of the minor shipbuilding nations, as compared with three months ago, is shown in the following table, giving gross tons of work in hand:

	Oct. 1, '21	July 1, '21
Italy	397,544	310,333
France	350,681	390,453
Holland	349,122	391,389
Japan	186,782	229,262
Brit. Dom'n's	144,460	177,912

Pacific Building

On October 1 there were 10 seagoing steel merchant vessels of an aggregate deadweight of 129,350 tons under construction in yards of the Pacific Coast of the United States, according to returns compiled by Pacific Marine Review. Vessels for the Navy and Coast Guard are not included. Three tankers of an aggregate deadweight tonnage of 33,140 were delivered in September, one being the 16,340-ton Tahamua, built by Moore for the Southern Pacific's Atlantic Line and the others being the 8400-tonners Amalthus and Sem-

Dixie Arrow, tanker Standard Transportation Company of New York, New York Shipbuilding Corporation, September 29.

Tugboat Staples Transportation Company, Staten Island Shipbuilding Company, August 4.

Canadian Constructor, freighter C. G. M. M., Halifax Shipyards, September 24.

Munargo, combination Munson Steamship Company, New York Shipbuilding Corporation, September 17.

Samuel Q. Brown, tanker, Tidewater Oil Company, Merchant Shipbuilding Corporation, October 15.

Eastern Deliveries UNITED STATES

G. Harrison Smith, ore and oil International Petroleum Company, Bethlehem Shipbuilding Corporation, Sparrows Point Plant, September 13.

Oak, lighthouse tender U. S., Consolidated Shipbuilding Corporation, October 10.

Hawthorn, lighthouse tender U. S., Consolidated Shipbuilding Corporation, October 10.

T. J. Williams, tanker Standard Oil Company, Oscar Daniels Company, September 17.

San Leopoldo, tanker Eagle Oil Transport Company, Globe Shipbuilding & Drydock Company of Maryland, July 28.

San Leonardo, tanker Eagle Oil Transport Company, Globe Shipbuilding & Drydock Company of Maryland, August 20.

Robert E. Hopkins, tanker Tide-water Oil Company, Merchant Shipbuilding Corporation, October 6.

John D. Archbold, tanker Standard Oil Company of New Jersey, Newport News Shipbuilding & Drydock Company, September 24.

Dixiano, sugar ship American Sugar Refining Company, Staten Island Shipbuilding Company, July 1.

Southern Cross, combination U. S. S. B., New York Shipbuilding Corporation, September 26.

J. N. Pew, tanker Sun Oil Company, Sun Shipbuilding Company, September 14.

Agwiharve, tanker Atlantic, Gulf & West Indies, Sun Shipbuilding Company, August 16.

Agwimex, same, October 4.

Hoosier State, combination U. S. S. B., New York Shipbuilding Corporation, September.

Empire Arrow, tanker Standard Transportation Company, New York Shipbuilding Corporation, September.

Pacific Keel-layings UNITED STATES

Ferryboat Six Minute Ferry Company, Bethlehem Shipbuilding Corporation, Alameda Works, August 27.

Pacific Launchings UNITED STATES

H. M. Storey, tanker Standard Oil Company of California, Bethlehem Shipbuilding Corporation, Alameda Works, September 28.

Modoc, cutter United States Coast Guard, Union Construction Company, October 1.

CANADIAN

Canadian Freighter, freighter C. G. M. M., J. Coughlan & Sons, October 12.

Canadian Britisher, freighter C. G. M. M., Wallace Shipbuilding & Drydock Company (Prince Rupert

Drydock & Engineering Company), October 6.

Pacific Deliveries UNITED STATES

F. H. Hillman, tanker Standard Oil Company of California, Bethlehem Shipbuilding Corporation, Alameda Works, October 21.

Semiramis, tanker Dutch Shell, Southwestern Shipbuilding Company, September 22.

West Prospect, freighter U. S. S. B., Los Angeles Shipbuilding & Drydock Company, October 5.

Haida, cutter United States Coast Guard, Union Construction Company, October 25.

Amalthus, tanker Anglo-Saxon Petroleum Company, Union Construction Company, September 28.

La Purisima, tanker Union Oil Company, Southwestern Shipbuilding Company, October 20.

CANADIAN

Canadian Transporter, freighter C. G. M. M., J. Coughlan & Sons, September 14.

Shipyard Reports

Pacific Coast, United States

BETHELEH SHIPBUILDING CORPORATION, LTD.

Potrero Works

Purchasing Agent: O. W. Street.
Submarines USN: S-31, hull 136; S-32, hull 137; S-33, hull 138; S-34, hull 139; S-35, hull 140; S-36, hull 141; S-37, hull 142; S-38, hull 143; S-39, hull 144; S-40, hull 145; S-41, hull 146; all launched; outfitting proceeding slowly.

Alameda Works

Chilore, hull 5309, combination ore and coal carrier Ore Steamship Co; 571-6 LOA; 550-1 LBP; 72 molded beam; 44 molded depth; 32-4 loaded draft; 11½ loaded speed; 20,000 DWT; Curtis turbines with Falk reduction gears, 5000 SHP; 3 Scotch SE boilers, 17-6x12, each 4287 sq ft; oil burners.

Lebore, hull 5310, combination ore and coal carrier Ore Steamship Co; sister to above.

F. H. Hillman, hull 5311, tanker Standard Oil Co of Cal; 500 LBP; 68 beam; 25-11 loaded draft; 11 loaded speed; 15,000 DWT; rec engs, 4000 IHP; 3 Scotch marine boilers, 16x 12-9; keel Jan10/21; launch July28/21; deliver Oct21/21.

H. M. Storey, hull 5312, tanker Stand Oil Co of Cal; sister to F. H. Hillman; keel Jan19/21; launch Sept 28/21; deliver Jan1/21, est.

W. S. Rheem, hull 5313, tanker Stand Oil Co of Cal; sister to F. H. Hillman; keel Mar1/21; launch Nov 10/21, est.

No name, hull 5314, ferryboat Six Minute Ferry Co; 230 LOA; 63-6 beam over guards, 42 molded; 19-6 molded depth; TE eng, 1400 IHP; propeller drive; 3 WT boilers; keel Aug27/21.

No name, hull 5315, ferryboat Six Minute Ferry Co; sister to above.

HANLON DRYDOCK & SHIPBUILDING CO., OAKLAND

Purchasing Agent: R. Barker.
Dan F. Hanlon, hull 189, steam schr. D. J. Hanlon; 2500 DWT; 1400 IHP engines; 2 B&W boilers.

LOS ANGELES SHIPBUILDING & DRYDOCK CO., SAN PEDRO

West Prospect, hull 34, steel cargo USSB; 430 LBP; 54 beam; 28-2 loaded draft; 10½ loaded speed; 11,000 DWT; TE engs, 3500 IHP; 3 Scotch single end, 15-9; keel Dec31/20; launch July30/21; deliver Oct5/21.

West Chopaka, hull 35, steel cargo USSB; sister to above; keel Feb24/21; launch Sept19/21; deliver Nov 25/21, est.



The largest merchant vessel constructed on the Pacific Coast of the United States and Canada: the 16,340 deadweight ton tanker Tamiha, built by the Moore Shipbuilding Company for the Atlantic steamship lines of the Southern Pacific. She broke the record of the sisters Manulani and Manuka, 14,000 tons deadweight, built by Moore for the Matson Navigation Company.

MOORE SHIPBUILDING COMPANY, OAKLAND

Purchasing Agent: W. E. Hostetter.
H. T. Harper, hull 163, tanker Standard Oil Co of California; 330 LBP; 46 beam; 21-6 loaded draft; 4750 DWT; Skandia Diesel engs; keel Oct/20; launch June/6/21; deliver Oct/30/21, est.

Birkenhead, hull 166, tanker for Vacuum Oil Co; 425 LBP; 57 beam; 26-3 loaded draft; 10,100 DWT; rec engs; 3 Scotch marine boilers, 15-2x 12; keel Dec/9/20; launch July/9/21; deliver Oct/25/21, est.

NAVY YARD, PUGET SOUND

Medusa, repair ship for government; 460 LBP; 70 beam; about 19 loaded draft; 17-5 loaded speed; turbine eng, 7000 IHP; 2 WT express type boilers; 10,000 tons disp; keel Jan/2/20; launch and deliver dates not set.

Holland, submarine tender for government; 460 LBP; 61 beam; about 20 loaded draft; 16 K loaded speed; turbine eng, 7000 IHP; two WT express type boilers; 10,000 tons disp; keel April/21.

NAVY YARD, MARE ISLAND

Montana, battleship USN; 660 LB P; 105 beam; 33 loaded draft; 23 loaded speed; 42,200 disp; turbo-electric engs, 60,000 SHP; 12 Bu's express boilers, 74,040 sq ft; keel Sept 1/20; work suspended.

SOUTHWESTERN SHIPBUILDING CO., EAST SAN PEDRO

Purchasing Agent: J. J. Wilson.

La Purisima, hull 23, Isherwood tanker Union Oil Co; 392 LBP; 51 beam; 23-11 loaded draft; 11½ loaded speed; 7500 DWT; TE engs, 2800 IHP; 3 Scotch boilers, 14x12; keel Dec/22/20; launch Sept/10/21; deliver Oct/20/21.

Semiramis, hull 26, Isherwood tanker Nederlandsche-Indische Tankstoomboot Maatschappij; 412 LBP; 53 beam; 24-7 loaded draft; 11 loaded speed; 8400 DWT; TE engs, 2700 IHP; 3 Scotch boilers, 15-6x11-7; keel Nov/5/20; launch Aug/6/21; deliver Sept/22/21.

TODD DRYDOCK & CONSTRUCTION CORP., TACOMA

Purchasing Agent: C. L. Banks.

Omaha, hull 100, scout cruiser USN; 655-6 LOA; 550 LBP; extreme beam 55-4; molded beam 54-9; depth molded 26; mean loaded draft 13-6; disp 7100 tons; Westinghouse Parsons turbines and reduction gear, 105,000 IHP; designated speed 34; 12 Yarrow WT boilers; keel Dec/6/18; launch Dec/14/20.

Milwaukee, hull 106, scout cruiser USN; sister to above; keel Dec/13/18; launch Mar/24/21.

Cincinnati, hull 107, scout cruiser USN; sister to above; keel May/15/20; launch May/23/21.

UNION CONSTRUCTION CO., OAKLAND

Purchasing Agent: A. J. Farnsworth.

Haida, hull 17, cutter USCG; 240 LOA; 39 beam; 14 loaded draft; 16 loaded speed; 1600 DWT; turbo-electric engs, 2600 IHP; 2 WT boilers; keel Sept/27/20; launch Apr/19/21; deliver Oct/25/21.

Mojave, hull 18, cutter U.S.C.G.; same as the above; keel Apr/16/21; launch Sept/7/21; deliver Nov/15/21, est.

Modoc, hull 19, cutter USCG; same as above; keel Apr/19/21; launch Oct 1/21; deliver Dec/15/21, est.

Shawnee, hull 20, cutter USCG; 150 L.O.A.; 30 beam; 13-6 loaded draft; 12½ loaded speed; 1000 DW T; rec engs, 1000 IHP; 2 WT boilers; keel Jun/1/21; deliver Jan/1/22, est.

Amaltheus, hull 23, oil tanker Anglo-Saxon Pet Corp, Ltd; 412 LBP; 53-5 beam; 24-9 loaded draft; 11 loaded speed; 8400 DWT; rec engs, 2600 IHP; 3 Scotch marine boilers, 15-6x11-7; keel Mar/12/21; launch Aug/1/21; deliver Sept/28/21.

Canadian**CHOLBERG SHIPYARD, VANCOUVER, B. C.**

Purchasing Agent: W. Meed.

(These vessels to be completed by Dominion government.)

Sir Henry Drayton, hull 5, 4-masted barkentine Victoria Shipowners, Ltd; 250 LOA; 45-6 beam; 21-10 loaded draft; 2400 DWT; sailing vessel; shaft logs fitted for auxiliary but no machinery installed; keel May 15/20.

No name, hull 6, 4-masted barkentine Victoria Shipowners, Ltd; sister to above; keel June/4/20.

No name, hull 7, 4-masted barkentine Victoria Shipowners, Ltd; sister to above; keel Feb/21.

J. COUGHLAN & SONS, LTD. VANCOUVER, B. C.

Purchasing Agent: J. Joseph.

Canadian Transporter, hull 20, steel freighter Canadian government; 400 LBP; 52 beam; 25-3 loaded draft; 11½ loaded speed; 8350 DWT; TE eng, 3000 IHP; 3 Scotch boilers, 15-6 x11-6; keel Jan/6/21; launch Aug/31/21; deliver Sept/14/21.

Canadian Freighter, hull 21, steel freighter Canadian government; sister to above; keel Jan 6/21; launch Oct/12/21.

PRINCE RUPERT DRYDOCK & ENGINEERING COMPANY PRINCE RUPERT

Canadian Britisher, steel cargo Canadian government; 8390 DWT; 2-deck; bridge, poop and forecastle; 11 speed; keel Oct/20/19; launch Oct 6/21.

This vessel is being completed by the Wallace Shipbuilding & Drydock Co, North Vancouver. The terms are time and material plus 8 per cent.

WALLACE SHIPBUILDING & DRYDOCK CO., VANCOUVER, B. C.

Princess Louise, Canadian Pacific; 317 LBP; 48 beam; 18½ deep;

16 knots; single-screw; 600 tons cargo space; accommodations for 200 passengers; keel Oct/20; launch Aug 29/21.

Atlantic and Gulf**AMERICAN BRIDGE COMPANY, PITTSBURGH, PENN.**

Purchasing Agent: W. G. A. Millar.
Twenty-five coal barges Carnegie Steel Co; 175 LBP; 26 beam; 8 loaded draft; 20 launched.

Two tow boat hulls Carnegie Steel Co; 140-2x34 4-5 loaded draft; launch and deliver Jan/22, est.

Two coal barges, 175 LBP; 26 beam; 8 loaded draft; undisclosed interests.

Fifteen decked barges, 120 LBP; 30 beam; 7 deep; US Engineers, Memphis, Tenn.

BALTIMORE DRYDOCK & SHIPBUILDING CO., BALTIMORE

A. G. Crosby, assistant general manager in charge of purchases.

Hull 125, tanker builder's account; 340 LBP; 49 beam; 23-6 loaded draft; 10 loaded speed; 6000 DWT; rec. eng, 2000 IHP; 2 Scotch boilers, 15-3; keel Nov/24/20.

Hull 126, tanker builder's account; 430 LBP; 59 beam; 25-4½ loaded draft; 10 loaded speed; 10,250 DWT; turb eng, 3000 IHP; 3 Scotch boilers, 15-3; keel Sept/27/20.

Hull 128, fireboat City of Baltimore; 115-6 LBP; 28 beam; 9-6 loaded draft; 12 loaded speed; rec eng, 1000 IHP; 2 B&W WT boilers; keel July/15/21.

BETHLEHEM SHIPBUILDING CORP., FORE RIVER PLANT, QUINCY, MASS.

Lexington, hull 1300, battle-cruiser U.S.N.

Raleigh, hull 1382, scout cruiser U.S.N.

Detroit, hull 1383, scout cruiser U.S.N.

Massachusetts, hull 1400, battle-ship USN.

And the following nineteen submarines USN: AA-2, hull 1270; hulls 1309 to 1320 inc, submarines S-18 to S-29 inc; hulls 1389 to 1394 inc; submarines S-42 to S-47 inc.

J. Fletcher Farrell, hull 1496, tanker Sinclair Nav Co; 430 LBP; 59 beam; 25-5 loaded draft; 11 loaded speed; 10,600 DWT; rec eng, 3200 IHP; 3 Scotch boilers, 15x11-9; launch June/10/21.

William Boyce Thompson, tanker Sinclair Nav Co; sister to above; keel Nov/1/21; launch July/21.

BETHLEHEM SHIPBUILDING CORP., HARLAN PLANT, WILMINGTON, DEL.

No name, hull 5477, tanker Atlantic Refining Co; 226 LBP; 39 beam; 17 loaded draft; 8½ loaded speed; 2600 DWT; turb eng, 750 IHP; B & W boilers; keel Aug/20/21.

BETHLEHEM SHIPBLDG. CORP., SPARROWS POINT PLANT, SPARROWS POINT, MD.

Pine Tree State, hull 4195, combination USSB; 518 LBP; 72 beam; 30-7 loaded draft; 16 loaded speed; turb eng, 10,000 IHP; 8 Yarrow boilers; keel Feb15/19; launch Mar 19/21.

Palmetto State, hull 4196; combination USSB; sister to above; keel Feb19/19; launch June21/21.

Nutmeg State, hull 4197, combination USSB; sister to above; keel July29/20; launch Sept17/21.

G. Harrison Smith, hull 4210, ore and oil Internat'l Pet Co; 550 LBP; 72 beam; 32-4 loaded draft; 11½ loaded speed; 20,000 DWT; rec eng 4600 IHP; 3 Scotch boilers, 17-6x12; keel July22/20; launch July12/21; deliver Sept13/21.

Bethore, hull 4211, ore and oil Ore SS Co; sister to above; keel Feb24/21.

Marore, hull 4212, ore and oil Ore SS Co; sister to above, except turb eng; keel May2/21.

Steelore, hull 4213, ore and oil Ore SS Co; sister to above; keel July 20/21.

CONSOLIDATED SHIPBUILDING CORPORATION, MORRIS HEIGHTS, N. Y.

Purchasing Agent: Bruce Scrimgeour.

Oak, hull 251, US lighthouse tender; 160 LOA; 30 beam; 9-6 loaded draft; 875 DWT; TE eng, 700 IHP; 1 Scotch boiler, 14 diam; keel Nov 22/20; launch June18/21; deliver Oct10/21.

Thorn, hull 252, US lighthouse tender; sister to above; keel Nov 22/20; launch June28/21; deliver Oct10/21.

No name, hull 246, US lightship; 146-3 LOA; 30 beam; 12-7 loaded draft; 825 DWT; comp eng, 400 IH P; 2 Scotch boilers, 10-6 diam.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO., PHILADELPHIA

Purchasing Agent: Ed. C. Geehr.

(Work held up)

Richmond, hull 448, scout cruiser USN; keel Feb16/20; launch Sept 29/21; 74 per cent comp Oct1.

Concord, hull 449, scout cruiser USN; keel Mar29/20; 68 per cent comp Oct1.

Trenton, hull 501, scout cruiser USN; keel Aug18/20; 51 per cent comp Oct1.

Marblehead, hull 502, scout cruiser USN; keel Aug4/20; 46 per cent comp Oct1.

Memphis, hull 503, scout cruiser USN; keel Oct14/20; 40 per cent comp Oct1.

OSCAR DANIELS COMPANY, TAMPA, FLORIDA

B. D. Benson, hull 11, Isherwood tanker Standard Oil; 466 LBP; 60 beam; 26-7 loaded draft; 10½ loaded speed; 11,900 DWT; QE eng, 2800

IHP; 3 Scotch boilers, 15x11-6; keel June29/20; launch Sept15/21.
T. J. Williams, hull 12, Isherwood tanker Standard Oil; sister to above; keel Aug11/20; launch May3/21; deliver Sept17/21.

FEDERAL SHIPBUILDING CO., KEARNY, N. J.

Purchasing Agent: J. L. Hastings.
Steel Seafarer, hull 43, freighter US Steel Products Co; 425 LBP; 56 beam; 25-10 loaded draft; 12 loaded speed; 9400 DWT; turb eng, 3100 IHP; 3 Scotch boilers, 15 diam; keel May25/21; launch Oct21, est.

Steel Pathfinder, hull 44, freighter US Steel Products Co; sister to the above; keel June1/21; launch Nov 12/21, est; deliver Dec3/21, est.

Steel Pioneer, hull 45, freighter US Steel Products Co; sister to the above; keel July21; launch Dec10/21, est; deliver Dec31/21, est.

GLOBE SHIPBUILDING & DRY- DOCK CO. OF MARYLAND, BALTIMORE

Purchasing Agent: H. B. McCauley.
San Leopoldo, hull 101, oil carrier Eagle Oil Transport Co; 401 LBP; 54 beam; 25-1 loaded draft; 10½ loaded speed; 8600 DWT; TE eng, 2800 IHP; 3 Scotch boilers, 15-3x11-6; keel Sept/20; launch June25/21; deliver July28/21.

San Leonardo, hull 102, oil carrier Eagle Oil Transport Co; sister to above; keel Sept/20; launch July8/21; deliver Aug20/21.

LAKE TORPEDO BOAT CO., BRIDGEPORT, CONN.

Purchasing Agent: C. D. Maxfield.
S-48, hull 48, submarine USN; launch Feb26/21.

S-49, hull 49, submarine USN; launch Apr23/21.

S-50, hull 50, submarine USN; launch June18/21.

S-51, hull 51, submarine USN; launch Aug20/21.

MERCHANT SHIPBUILDING COR- PORATION, CHESTER, PENN.

Vice-President: J. L. Ackerson.

Robert E. Hopkins, hull 383, tanker Tidewater Oil Co; 424 LBP; 58 beam; 25-5 loaded draft; 10½ loaded speed; 10,000 DWT; TE eng; 3 Scotch boilers, 15-3x11-7; keel Aug 30/20; launch Aug6/21; deliver Oct 6/21.

Samuel Q. Brown, hull 384, tanker Tidewater Oil Co; sister to above; keel Oct1/20; launch Oct15/21.

Californian, hull 385, freighter American-Hawaiian SS Co; 445 LBP; 59-8 beam; 28-6 loaded draft; 11½ speed; 11,000 DWT; 2 6cyl, 4-cycle Diesel engs, 4500 metric; 1 vertical donkey, 400 sq ft HS; keel Feb5/21; launch Nov11/21, est.

Missourian, hull 386, freighter American-Hawaiian SS Co; sister to above; keel Feb10/21; launch Nov 11/21, est.

No name, hull 387, fireboat City of Philadelphia; 120-9 LOA; 28 beam; 12-9 deep; 9 loaded draft;

comp eng, 500 IHP; 2 B&W WT boilers, oil; 4 turbine fire pumps, 1 30-foot tower, 2 15-foot towers; capacity 12,000 gals a minute; keel Sept 15/21; launch Dec/21, est.

NAVY YARD, BOSTON

Whitney, destroyer tender No. 4 USN; 460 LBP; 60-11 beam; 21 normal draft; 16 loaded speed; 10,600 normal disp; geared Parsons turbs, 7000 SHP; 2 WT exp small tube boilers; keel Apr23/21; launching indefinite.

NAVY YARD, PHILADELPHIA

(All work practically suspended since July 1/21.)

Dobbin, hull 7, destroyer tender USN; 460 LBP; 60-10 beam; 21 loaded draft; 16 loaded speed; 10,600 tons disp; Parsons geared turb single screw engs, 7000 SHP; 2 WT boilers; keel Dec23/19; launch May 5/21; deliver date not determined.

Constitution, hull 8, battle cruiser USN; 850 LBP; 105-4 beam; 30-11½ loaded draft; 33½ loaded speed; 43,500 disp; electric drive, 180,000 SHP; 16 WT boilers; keel Sept 25/20; launch and deliver dates not determined.

United States, hull 9, battle cruiser USN; 850 LBP; 105-4 beam; 30-11½ loaded draft; 33½ loaded speed; 43,500 disp; electric drive, 180,000 SHP; 16 WT boilers; keel Sept25/20; launch and deliver dates not determined.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY, NEWPORT NEWS

Purchasing Agent: James Plummer, 233 Broadway, New York City.

West Virginia, hull 211, battleship USN; 600 LBP; 97-3½ beam; 30-6 mean draft; 32,600 normal disp; 21 speed; GE turbo-elec drive, 28,900 SHP; 8 B&W WT boilers, oil, 41,768 sq ft plus 4168 superheat; keel Apr 12/20.

Constellation, hull 215, battle-cruiser USN; 850 LBP; 101-8½ beam; 31 mean draft; 43,500 normal disp; 33½ speed, est; Westinghouse turbo-elec drive, 180,000 SHP; 16 WT boilers, oil, 198,000 sq ft plus 18,000 superheat; keel Aug18/20.

Ranger, hull 215, battle-cruiser USN; sister to above; keel June23/21.

Iowa, hull 258, battleship USN; 660 LBP; 105 beam; 33 mean draft; 43,200 normal disp; 23 speed; GE turbo-elec drive, 60,000 SHP; 12 White-Forster WT boilers, oil, 82,800 sq ft plus 8940 superheat; keel May17/20.

John D. Archbold, hull 261, tanker Standard Oil NJ; 555 LBP; 75 beam; 30 loaded draft; 10½ loaded speed; 20,300 DWT; twin screw, TE eng, 3800 IHP; 3 Scotch boilers, 17x12; keel Dec15/20; launch Aug20/21; deliver Sept24/21.

Wm. Rockefeller, hull 262, tanker Standard Oil NJ; sister to above; keel Dec15/20; launch Oct21, est; deliver Nov21, est.

NEW YORK SHIPBUILDING CORPORATION, CAMDEN, N. J.

Purchasing Agent: L. G. Buckwalter.

Southern Cross, hull 241, combination USSB; 534 LBP; 72 beam; 30-6 loaded draft; 18 loaded speed; 11,000 DWT; geared turbs, 12,000 SHP; 8 WT boilers; keel Aug/18; launch July/20; deliver Sept/26/21.

Bay State, hull 251, combination USSB; 534 LBP; 72 beam; 30-6 loaded draft; 18 loaded speed; 11,000 DWT; geared turbs, 12,000 SHP; 8 WT boilers; keel Oct/15/19; launch July/20; deliver winter/21, est.

Peninsula State, hull 252, combination USSB; sister to above; keel July/20/20; launch July/26/21; deliver spring/22, est.

Lone Star State, hull 255, combination USSB; sister to above; keel May/13/19; launch Oct/23/20; deliver fall/21, est.

Hoosier State, hull 256, combination USSB; sister to above; keel May/20/19; launch Oct/23/20; deliver Sept/21.

Empire Arrow, hull 261, bulk oil Standard Trans Co of NY; 468 LBP; 62-6 beam, 27-0 1/2 loaded draft; 10 1/2 loaded speed; 12,550 DWT; 4 cyl QE engs, 3200 SHP; 3 SE Scotch boilers, 15-2x11-6; keel Sept/14/20; launch May/24/21; deliver Sept/21.

Levant Arrow, hull 262, bulk oil Standard Trans Co of NY; sister to above; keel Nov/4/20; launch July/25/21; deliver fall/21, est.

Munargo, hull 263, combination Munson SS Co; 414 LBP; 57-6 beam; 23 loaded draft; 15 1/2 loaded speed; 4950 DWT; geared turbs, 5800 SHP; 5 SE Scotch boilers, 16-4x12-3; keel Sept/30/20; launch Sept/17/21; deliver winter/21, est.

Eurana, hull 264, bulk oil stock; 419-3 LBP; 56-3 beam; 25-9 1/4 loaded draft; 10 1/2 loaded speed; 9870 DWT; 3 cyl TE engs, 3000 SHP; 3 SE Scotch boilers, 15-10x11-4; keel Jan/17/21; launch July/16/21; deliver winter/21.

No name, hull 265, bulk oil stock; sister to above.

Dixie Arrow, hull 266, bulk oil Standard Trans Co of NY; 468 LBP; 62-6 beam; 27-0 1/2 loaded draft; 10 1/2 loaded speed; 12,550 DWT; 4 cyl QE engs, 3200 SHP; 3 SE Scotch boilers, 15-3x11-6; keel Aug/1/20; launch Sept/29/21; deliver winter/21, est.

Saratoga, hull 199, battle cruiser USN; 874 LOA; 850 LBP; 105-5 1/2 extreme beam; 31 mean draft; 45-50 normal disp; 33 1/2 loaded speed; GE turbo-electric drive, 180,000 SHP; 16 WT boilers, 198,000 sq ft plus 18,000 superheat; keel Sept/25/20.

Colorado, hull 200, battleship USN; 624 LOA; 600 LBP; 97-3 1/2 beam; waterline; 30-6 mean draft; 32,600 normal disp; 21 loaded speed; Westinghouse turbo-electric drive, 28,900 SHP; 8 B&W WT boilers, 41,678 sq ft plus 4169 superheat; keel Mar/29/19; launch Mar/22/21.

Washington, hull 201, battleship

USN, sister to above; keel June/30/19; launch Sept/21.

Kamoi, hull 267, fuel ship Japanese Navy; 497-8 LOA; 67 beam; 28 designed draft; 15 loaded speed; 13,000 DWT; elec drive, 8000 SHP; 4 B&W boilers; keel Sept/14/21.

STANDARD SHIPBLDG. CORP'N, SHOOTERS ISLAND, MARINERS HARBOR, N. Y.

Purchasing Agent: Jamie Cortada. John Purroy Mitchell, hull 32, fireboat City of New York; 121 LBP; 27 beam; 14-9 deep; 12 loaded speed; comp eng, 900 IHP; 2 B&W WT boilers, oil burning; keel Mar/31/21; launch Aug/6/21.

STATEN ISLAND SHIPBUILDING COMPANY, STATEN ISLAND, NEW YORK

Purchasing Agent: R. C. Miller. Dixiano, hull 726, sugar ship Am Sug Ref Co; 360 LBP; 50 beam; 23 loaded draft; 10 loaded speed; 6300 DWT; TE eng, 2000 IHP; 2 Scotch boilers, 15x11; keel Sept/9/20; launch May/21/21; deliver July/1/21.

Hell Gate, hull 728, dredge C. R. Browning; 140 LBP; 48 beam; 15 loaded draft; keel Aug/28/20; launch Feb/23/21.

Hull 736, tugboat Staples Trans Co; 136 1/2 LBP; 27 beam; 16 1/2 loaded draft; 10 loaded speed; 1 TE eng 700 HP; 1 Scotch boiler, 16x11 1/2; keel May/16/21; launch Aug/4/21.

President Roosevelt, hull 737, ferryboat City of New York; 247 LBP; 66 beam; 19 1/2 loaded draft; 15 loaded speed; 1 F&A comp eng, 3500 HP; 4 B&W WT boilers, 13,000 sq ft; keel May/23/21; launch Nov/5/21, est.; deliver Nov/19/21, est.

Northwestern, tanker Am Pet Co; 242 LBP; 42 beam; 23 loaded draft; 10 loaded speed; TE eng; 2 Scotch boilers; lengthening job, additional 66 ft, making 2 new cargo tanks, 1000 DWT additional capacity. Vessel considered total loss by fire; raised; and now undergoing general repairs and at the same time lengthening. Work completed.

SUN SHIPBUILDING COMPANY, CHESTER, PENN.

Purchasing Agent: H. W. Scott. J. N. Pew, hull 39, tanker Sun Oil Co; 480 LBP; 65-9 beam; 26-7 loaded draft; 10 1/2 loaded speed; 12,800 DWT; single screw QE engs, 4300 IHP; 3 SE Scotch boilers, 15-10x11-1 1/4; keel Nov/5/20; launch Apr 23/21; deliver Sept/14/21.

Agwharve, hull 40, tanker A. G. W. I. S. Co; 480 LBP; 65-9 beam; 26-7 loaded draft; 12 loaded speed; 12,500 DWT; single screw QE engs, 4300 IHP; 4 SE Scotch boilers, 15-10x11-1 1/4; keel Nov/26/20; launch Apr 2/21; deliver Aug/16/21.

Agwimex, hull 41, tanker A. G. W. I. S. Co; sister to above; keel Dec/8/20; launch Aug/6/21; deliver Oct 4/21.

Agwisoot, hull 42, tanker A. G. W. I. S. Co; sister to above; keel Dec/3/20.

Agwistates, hull 43, tanker A. G. W. I. S. Co; sister to above; keel Jan/3/21.

No name, hull 46, tanker Sun Oil Co; 480 LBP; 65-9 beam; 26-7 loaded draft; 10 1/2 loaded speed; 12,800 DWT; single screw QE engs, 4300 IHP; 3 SE Scotch boilers, 15x11-1 1/4; keel not laid.

No name, hull 47, tanker Sun Oil Co; sister to above; keel not laid.

TEXAS STEAMSHIP COMPANY, BATH, MAINE

Purchasing Agent: A. R. Weber. No name, hull 32, tanker Texas SS Co; 415-10 LBP; 56 beam; 25-7 1/2 loaded draft; 11 1/2 loaded speed; 9600 DWT; TE engs, 3000 IHP; 3 Scotch boilers, 15-3x11; keel Nov 9/20.

Canadian**DAVE SHIPBUILDING & REPAIRING COMPANY, LTD., LAUZON LEVIS, P. Q., CANADA**

Purchasing Agent: N. W. Van Wyck.

Canadian Challenger, hull 476, single-screw cargo Canadian government; 400 LBP; 52 beam; 25-3 loaded draft; 11 1/2 loaded speed; 8350 DWT; TE surface cond engs, 3000 I HP; 3 Scotch marine boilers, 15-6x11-6; keel May/14/20; launch July 7/21.

NOVA SCOTIA STEEL & COAL CO., TRENTON, N. S.

Purchasing Agent: A. M. Seely. Sea King, hull 9, exploring yacht Baron Bliss, Nassau, Bahamas; 137-10 LBP; 28-6 beam; 6 loaded draft; 7 loaded speed; semi-Diesel 440 BH P, twin-screw eng; keel Aug/24/20.

Miscellaneous Construction**ALLAN CUNNINGHAM COMPANY, SEATTLE**

On order and under construction: 6 steam and electric steering gears; 13 steam and electric anchor windlasses; 18 steam and electric and hydro-electric and hand capstans; 37 steam and electric winches.

M. T. DAVIDSON COMPANY, 154 NASSAU STREET, NEW YORK CITY

Vertical beam, twin-cylinder air-pump, 9-18-18x12 and two vertical duplex boiler feed pumps 9-16x10 for New York City fireboat John Purroy Mitchell.

Vertical, twin-screw air-pump, 14-24x15, two vertical simplex boiler feed pumps 10-6x12, one horizontal simplex sanitary pump 5 1/2x8 for Philadelphia fireboat Rudolph Blankenburg.

Similar equipment for second Philadelphia fireboat.

JAMES C. H. FERGUSON, SALES AGENT, MONADNOCK BLDG., SAN FRANCISCO

Pneumercator Co; 40 pneumercators for 4 Coast Guard cutters, Union Construction; 2 for West Cho-

paka, Los Angeles; 60 for 12 sub-marines USN, Bethlehem.

Rostand Mfg. Co.: air ports and lenses complete 5 Coast Guard cutters.

FORD & GEIRRIE, AGENTS, SAN FRANCISCO

Dean feed pumps, Dean Bros' Steam Pump Works, for 166 at Moore's; Reliance forced draft equipment, Jno Reid & Company, for hull 166 at Moore's; National stockless anchors Upson Walton Co., hull 166, Moore's; Dean feed pumps, Dean Bros' Steam Pump Works, hull 23, Southwestern; Willett Bruce whistle control, McNab Co., hulls 16, 17, 18, 19, Union Construction; McNab direction indicators, McNab Co., hulls 16, 17, 18, 19, Union Construction; Reliance forced draft equipment, John Reid & Co., hull 23, Southwestern; Anchor chain, Lebanon Chain Co., hull 23, Southwestern; windlass, gypsy and steering gear, Hyde Windlass Co., hull 20, Union Construction; Welin davits, American Balsa Co., hulls 5311-2-3, Bethlehem, hull 163, Moore; Willett-Bruce whistle control, McNab Co., hulls 5311-2-3, Bethlehem; McNab direction indicator, hull 35, Los Angeles; Balsa wood for cold storage, American Balsa Co., hulls 5311-2-3, Bethlehem; Mills releasing gear, hull 26, Southwestern; balsa wood cold storage, American Balsa Co., hull 23, Southwestern.

PACIFIC DIESEL ENGINE COMPANY, OAKLAND (Formerly Skandia Pacific Oil Engine Company)

Purchasing Agent: A. Bolander. Ten 850 BHP Workshop Diesel engs building for USSB; 6 cyl, 135 RPM; 8 delivered.

One 150 BHP Workshop Diesel marine engine.

One 100 BHP Skandia marine eng. Several small Skandia engs from 9 to 36 BHP.

One 140 BHP Skandia marine engine.

STEWART DAVIT & EQUIPMENT CORP., NEW YORK, SAN FRANCISCO, SEATTLE

Steward davits are being installed in the following: At Union Coast Co.: Coast Guard cutters, hulls 17, 18, 19; Canadian Pacific lines, Wallace yard, Vancouver.

Drydocking and Repairs

BETHELEHEM SHIPBUILDING CORPORATION, LTD.

Potrero Works

Miscellaneous repairs, drydocking, painting: Annette Rolph, Wyadna (also new propeller), E. Antoni, T. C. Condare, Alvarado, Broad Arrow (also new tailshaft), Empire State, Baja California, China Arrow, La Hermite, Multnomah, Johanna Smith, Benj. Brewster (also boiler repairs). Engine, boiler, hull repairs, drydocking, painting: Ecuador, San Juan, Sinaloa. Miscellaneous repairs: Wolverine State, Los Angeles, Walter Luckenbach, Sonoma, Kina, Sem-

iramis, Romulus, Andrea Luckenbach, Willpolo, Walter Luckenbach, Natal, Lyman Stewart, Hattie Luckenbach, F. J. Luckenbach, Johan Poulsen. Electric welding on boilers: Frederick Luckenbach. Repairs to cargo pump: Olinda. Engine, boiler, hull repairs: Marama. Parts for main engine: Montebello. Remetalizing bedplate bearings: San Juan. Repairs to main steam pipe: Northland. Repairs to circulating pump: Columbia. Two new propellers: Johanna Smith. Repairs to air compressor: Valparaiso.

Alameda Works

Miscellaneous repairs, drydocking, painting: John M. Mullin, P. C. Dredging Co., Dredge No. 5.

LOS ANGELES SHIPBUILDING & DRYDOCK COMPANY, SAN PEDRO

Cleaning and painting: Destroyers Renshaw, O'Bannon, Howard, Hogan, Wood, Stansbury; Tug San Pedro, Army tug Lt. G. M. Harris; North Bend, Oil barge No. 24, West Prospect, Submarines R-1, R-2, H-4, H-9; West O'Rowa (also reconditioning). Cleaning, painting, propeller, rudder, and extensive machinery repairs: San Joaquin. Boiler repairs: Andrea Luckenbach. Minor repairs: Harry Luckenbach, Cape Romain, Stockton, Edward Luckenbach. General overhauling: Pow Wow. Docks caulked: Pacific.

MOORE SHIPBUILDING COMPANY, OAKLAND

Engine and hull repairs: Creole State, Gleaner, Golden Gate, China, Buford, La Placencia. Hull repairs: Speedway, Berkeley, West Nomen-tum (also new stern frame), La Merced, Claremont. Engine repairs: Celestial, Lydonia, Woron, Maui, Santa Barbara, Manulani, Manukai. Drydocking, cleaning, painting: Hawarden, San Pablo, Sonoma. Drydocking, cleaning, painting, miscellaneous hull repairs: Christopher Columbus, Annie Johnson, Comanche, King No. 2. New strap for connecting rod: Sausalito. Drydocking, cleaning, painting, engine repairs: Columbia (also hull), Matsonia.

NAVY YARD, PUGET SOUND

Drydocking, miscellaneous repairs: Sinclair, Swallow, Doyen, Henshaw, McCawley, Meyer, Moody, Mahopac. Drydocking, cleaning and painting bottom, miscellaneous repairs: Tat-nuck. Minor repairs: Great Northern, Wenatchee (also docking). Miscellaneous repairs: Laub, McLanahan, Greene, Ballard, Shubrick, William Jones, John Francis Burns, Saturn, Neptune. Repairs to cable machinery: Burnside. Miscellaneous repairs incident to operation as district craft: Eagle No. 57, Paw-tucket, Sotoyomo, Iroquois, Oregon, Seattle, Missoula, Charlotte, S.C.310.

PORT ARTHUR SHIPBUILDING CO., LTD., PORT ARTHUR, ONTARIO, CANADA

Repairs to bottom damage, cabin, etc.: Francis Wilder.

TODD DRY DOCKS, INC., SEATTLE

Cleaning and painting: Washington Tug & Barge Co. barges 11, 15, 19, 38; Tug Dan'l Kern, Waialeale, Puget, Eastern Gen (also miscellaneous repairs), Pioneer, Contra Costa. Remodeled for ferry steamer: What-com. Miscellaneous repairs: Yachts Hoqua, Sanwan, Hopestill; Redondo, Apus, West Ivan. Voyage repairs: Protoslaus, Ixion. Overhauling fan motor: Lewis Luckenbach. General betterments: Silver State, Wenatchee (also alterations). New cast iron propeller: Calista.

Insurance Notes

After a great deal of speculation has been aroused as to the cause of the flooding of the C. G. M. M. freighter Canadian Importer, which was a helpless derelict a few weeks ago, workmen at Vancouver discovered a crack 2½ feet long in a bath-room pipe passing through No. 2 hold. The pipe passed through the hull at the waterline and the crack in the pipe was just inside the hull. This might account for the vessel leaking. Her hull and valves were reported to be in perfect condition.

* * *

The schooner Columbia River, owned by the Life Shipping Company, has been lost on Sunday Island, South Pacific. She was insured for \$45,000, most of the risk being carried in San Francisco.

* * *

Willcox, Peck & Hughes have opened an office in the Railway Exchange building, Portland, Oregon, in charge of Frank C. Wynne.

* * *

Federal Judge Jeremiah Neterer, Seattle, has awarded Ray Small, master of the tug Aleut, and his crew salvage of \$1200 for towing the Shipping Board steamship West Ision from the burning West Waterway Dock, Seattle, in July. Attorneys for the Shipping Board asserted that although the tug had been called to tow the West Ision, the steamer could have moved under her own power. The original claim was for \$50,000, but was reduced to \$15,000.

* * *

Young Brothers, tugboat owners of Honolulu, have installed fire engines on one of their vessels under an agreement with the harbor commissioners. The engines are 108-horsepower Seagraves attached to 1100-gallon, four-stage Seagraves pumps. Chemical apparatus also will be carried. Honolulu has had no fireboat protection heretofore.

With the Exporters and Importers

Pacific Rate Changes

Pacific Coast rates are showing a tendency to increase, although in some cases there is little more than a tendency and such actual raises as have been made are offset to some degree by reductions. The California Westbound Conference has made some increases and appears to be on the verge of making others; but rates have been falling so long that operators are almost at a loss when raises are discussed. In view of the actual shortage of cargo space, which is traceable to withdrawals of Shipping Board tonnage, freights easily might stiffen without any detriment to business.

Effective September 29 the conference made the following changes: spelter, reduced from \$10 to \$8, weight; wheat and flour to China and the Philippines, increased from \$6 to \$7, weight; overland leather, increased from \$20 for sole, weight, and \$18 for scrap, weight, to \$14, weight or measurement, or substantially increases of from \$2 to \$4 because of the measurement plan; local leather, from \$16, weight or measurement, to \$16, measurement, new N. O. S.; rice and rice bran, from \$6 to \$7, weight.

Steel at \$6.50

Steel remains a bugbear. In late September the North Atlantic-Far East lines were quoting \$10 and some were accepting \$8. Reliable information is to the effect that one steamship line offered to accept a shipment of 1000 tons from Washington, Pennsylvania, to the Far East at a rate of \$9 a long ton. Inasmuch as the New York railroad rate of \$2.90 or the Baltimore and Philadelphia rate of \$2.50, in addition to other costs, would have to be deducted, the actual water rate offered on this particular consignment was \$6.50 or less. Such a rate knocks into a cocked hat any immediate plans for restoring any movement of steel by the Pacific Coast, although the railroads are working on a plan that may be of some avail when the present North Atlantic demoralization has passed. That the end of the worst is in sight is indicated by the statement of a competent authority to the effect that bookings are increasing materially and that he expected the "space-filling" rates to stiffen greatly within 60 or 90 days from October 1, when shipments would be much larger.

Trans-Pacific Lumber

Trans-Pacific lumber remains in a curious position. On September 15 the Shipping Board operators made

a rate of \$15, but it was on paper only and resulted in no shipments being booked. In late September foreign lines raised the tariff to \$17.50, and the board followed their lead; the Japanese then cut to \$16. At the middle of October the San Francisco rate was \$15, but no business was being accepted at less than \$17.50; and the Columbia River was firm at \$16. No business was being booked by Shipping Board vessels beyond January 1, and, inasmuch as most of them were filled with old contracts, new bookings of consequence could not be made. All in all, however, there has been a marked stiffening of lumber rates.

In the Far East the Trans-Pacific Freight Tariff Bureau of Japan has affirmed its intention of abiding by conference rates, regardless of cutting by outside lines, even though direct competition exists. The Japanese organization may be able to maintain that attitude, but it is well to recall that rate-cutting by non-conference lines usually forces the conference to reduce its tariffs. The China Mail advised the bureau that it intended to quit the conference after October 1.

Rates in Two Currencies

The Pacific Coast-Australasian Freight Tariff Bureau has succeeded in doing what many others have talked of doing. It has quoted lumber rates in both Canadian and United States currencies, thus avoiding the troubles attendant upon the difference in exchange, which has led to quite a bit of indirect rate-cutting through the acceptance of depreciated Canadian currency and also has given Canada an advantage over the United States in lumber-exporting. The new rates are reductions from the first published tariffs, but they do straighten up a tangled situation and in a real sense are increases. The changes follow: British Columbia to Sydney, Melbourne and Adelaide, \$18, Canadian funds, the old rates being \$22 Adelaide, \$21 Melbourne, \$20 Sydney, United States gold; British Columbia to New Zealand, \$20, Canadian currency, as against the former rate of \$20, U. S. G.; United States Pacific Coast to Sydney, Melbourne and Adelaide, \$16.50, U. S. G., as against \$20, \$21 and \$22, U. S. G., to those ports in order; United States Pacific Coast to New Zealand, \$18, U. S. G., as against an old rate of \$20. Redwood lumber from lumber ports has been set at \$20, New Zealand, and \$18, Australia; and from San Francisco at \$18 and \$16.50.

Other weight or measurement rates given in Supplement No. 1, Tariff No. 1, are: automobiles, not exceeding 5000 pounds, \$20; dried codfish, \$16; tires, \$20; tree wash, \$15; overland automobiles and motorcycles, \$12; gasoline, distillate and kerosene in cases, 35 cents to Auckland, Wellington, Lyttleton, Dunedin, Melbourne and Sydney; other ports, 45 cents; lubricating oil, cut from \$10 to \$8 to Auckland, Wellington, Melbourne and Sydney, and from \$12 to \$10 to other ports. A movement of about 1000 tons of lubricating oil a month is expected to result from the reductions.

Williams, Dimond & Company, American-Hawaiian agents, announced a new rate on canned goods in strapped cases, Pacific Coast to United Kingdom, of 90 cents, effective October 10.

Intercoastal Lumber Charters

The North Atlantic-Pacific Coast Westbound Conference, acting in this instance for its sister organization, the Pacific Coast-North Atlantic Eastbound Conference, has adopted lumber rates and conditions to govern the movement of full cargoes and parcel lots from the Pacific to the Atlantic in the United States coastwise trade. Action was taken by the Eastern body because the Western had declined to draft a charter party at the behest of the Shipping Board, which thereupon appealed to the Atlantic conference.

Draft of Charter Form

Lumber rates and conditions as adopted at a special meeting of the North Atlantic-Pacific Coast Westbound Conference October 3 follow:

FULL CARGOES:

Rates \$17 per M, board feet (net measurements to govern).

Loading 400,000 feet, board measure, per day.

Discharging 350,000 feet, board measure, per day.

Demurrage 15 cents per net registered ton.

No dispatch.

No brokerage.

No absorption of insurance on deck loads.

Free time—vessel to give charterers 24 hours' notice prior to the time vessel will be ready to load.

Lay days to start when vessel begins loading or at the expiration of 24 hours' notice.

If stevedoring is performed by the charterers they are to be allowed not to exceed \$2 per 1000 feet board measure for loading and not to exceed \$1.50 per 1000 board feet for discharging.

The Pacific Coast lumber scale shall be used in computing board

7. After the goods are loaded the bill of lading to be issued by the carrier, master or agent of the carrier to the shipper, shall be in the form of a "shipped" bill of lading, provided that no "received for shipment" bill of lading or other document of title shall be received or issued in respect of the goods.

In exchange for and upon surrender of a "received for shipment" bill of lading the shipper shall be entitled when the goods have been loaded to receive a "shipped" bill of lading which has subsequently been noted by the carrier, master or agent with the name or names of the ship or ships upon which the goods have been shipped and the date or dates of shipment, shall for the purpose of these rules be deemed to constitute a "shipped" bill of lading.

Any clause, condition or agreement in a contract of carriage relieving the carrier or the ship from liability for loss or damage to or in connection with the goods arising from negligence, fault or failure in the duties and obligations provided in this article or lessening such liability otherwise than as provided in these rules, shall be null and void, and of no effect.

ARTICLE IV.—Rights and Immunities

1. Neither the carrier nor the ship shall be liable for loss or damage arising or resulting from seaworthiness unless caused by want of due diligence on the part of the carrier to make the ship seaworthy, and to secure that the ship is properly manned, equipped and supplied.

2. Neither the carrier nor the ship shall be responsible for loss or damage arising or resulting from: (a)—Act, neglect, or default of the master, mariner, pilot, or crew of the carrier in the navigation or in the management of the ship. (b)—Fire, (c)—Perils of seas and of the winds, (d)—Act of God, (e)—Act of war, (f)—Act of public enemies, (g)—Act of pirates, (h)—Act of rioters, ralers or people, or seizure under legal process, (i)—Charterparty restrictions, (j)—Act of omission of the shipper or owner of the goods, his agent or representative, (k)—Strikes of lock-out or stoppage or restraint of labor from whatever cause, whether partial or general, (l)—Riots and civil commotions, (m)—Saving or attempting to save life or property at sea, (n)—Inherent defect, quality or vice of the goods, (o)—Insufficiency of packing, (p)—Inefficiency or inadequacy of marks, (q)—Lapse of time not discoverable by due diligence (u). Any other cause arising without the actual fault or privity of the carrier, or without the fault or neglect of the agents, servants or employees of the carrier.

3. Any deviation in saving or attempting to save life or property at sea, or any deviation authorized by the contract of carriage shall not be deemed to be an infringement or breach of these rules or of the contract of carriage, and the carrier shall not be liable for any loss or damage resulting therefrom.

4. Neither the carrier nor the ship shall be responsible in any event for loss of, or damage to or in connection with goods in an amount beyond \$100 per package or unit, or the equivalent thereof in other currencies, unless the nature and value of such goods have been declared by the shipper before the goods are shipped and have been inserted in the bill of lading.

By agreement between the carrier, master or agent of the carrier and the shipper another maximum amount than mentioned in this paragraph may be fixed, provided that such maximum shall not be less than the figure above named.

The declaration by the shipper as to the nature and value of any goods shipped shall be prima facie evidence, but shall not be binding or conclusive on the carrier.

5. Neither the carrier nor the ship shall be responsible in any event for loss or damage to or in connection with goods if the nature and value thereof has been written in the bill of lading by the shipper.

6. Goods of an inflammable or explosive nature, or of a dangerous nature, unless the nature and character thereof have been declared in writing by the shipper to the carrier, master or agent of the carrier, and the carrier, master or agent of the carrier has consented to their shipment, may at any time before delivery be destroyed or rendered innocuous by the carrier without compensation to the shipper, and the shipper shall be liable for all damages and expenses directly or indirectly arising out of or resulting from such shipment. If any such goods are shipped with such consent shall become a danger to the ship or cargo they may in like manner be destroyed or rendered innocuous by the carrier without compensation to the shipper.

7. The carrier shall be at liberty to surrender in whole or in part all or any of his rights and immunities under this article, provided such surrender shall be embodied in the bill of lading issued to the shipper.

ARTICLE V.—Special Conditions

Notwithstanding the provisions of the preceding articles, a carrier, master or agent of the carrier and a shipper shall in regard to any particular goods be at liberty to enter into any agreement in any terms as to the responsibility and liability of the carrier for such goods, and as to the rights and immunities of the carrier in respect of such goods, and the carrier shall be bound to observe his obligation as to seaworthiness, or the care or diligence of his servants or agent in the loading, stowage, handling, loading, stowage, custody, care and unloading of

the goods carried by sea, provided that in this case no bill of lading shall be issued and that the terms agreed shall be embodied in a receipt which shall be a non-negotiable document and shall be marked as such.

Any agreement so entered into shall have full effect.

ARTICLE VI.—Limitations on the Application of the Rules

Nothing herein contained shall prevent a carrier or a shipper from entering into any agreement, stipulation, condition, reservation or exemption as to the responsibility and liability of the carrier or the ship for the loss or damage to or in connection with the custody and care and handling of goods prior to the loading on and subsequent to the unloading from the ship on which the goods are carried by sea.

ARTICLE VII.—Limitation of Liability

The provisions of these rules shall not affect the rights and obligations of the carrier under the convention relating to the limitation of the liability of owners of seagoing vessels.

The Cotton Reduction

In according to the request of the Galveston Commercial Association and the International Great Northern Railroad for a suspension of a proposed export rate on cotton from Texas and Oklahoma to the Pacific Coast, the Interstate Commerce Commission apparently has set a precedent. The consequences of this action, direct and indirect, may be of the greatest importance, said J. D. Mansfield, traffic commissioner of the transportation bureau of the Seattle Chamber of Commerce. He

import or export rate reduction to establish or re-establish a rate parity, shippers having a selfish interest in favoring some particular port, or some particular steamship line, will demand a suspension and demand that the railroads prove to the commission that the proposed new rate is a compensatory rate that will not impair railroad revenue.

Bickering Without End

This would give rise to bickering and litigation without end, for each proposed export or import rate reduction might be subjected to a separate attack, making it nearly impossible for the railroads to place the various seaports on an equal basis to compete for overseas business.

Volume of Business

This case, therefore, in view of the questions involved, assumes an importance beyond the immediate volume of trade for which Galveston is fighting. But the cargo movement alone, if there were no other issue, is sufficient to arouse the Pacific to combat the Gulf. The following table shows the Southwest-Oriental cotton movement in bales in August and September, 1921 and 1920:

	Aug. 1, 1921, to Sept. 30, 1921	Aug. 1, 1920, to Sept. 30, 1920
Total China and Japan.....	222,071	2026
Receipts Pacific Coast ports.....	42,848	407
Total exports, San Francisco.....	8,980	404
Total exports, other Pacific Coast ports ..	33,868	3
Remainder, Atlantic and Gulf.....	179,223	1619

is quoted as follows in the Seattle Times:

This cotton rate case seems to be the first on record where the Interstate Commerce Commission has interfered to prevent a voluntary reduction in an import or export rate by a railroad. Until the transportation act of 1920 was passed the authority of the Interstate Commerce Commission was clearly limited to the fixing of maximum rates, and for that reason the commission never asserted jurisdiction over export and import rates, lower than the domestic rates and established by the carriers for the purpose of fostering foreign trade.

Jurisdiction Over Minimum Rates

We have not yet made a close examination of the provisions of the new transportation act, but it seems that a danger to the export and import rate system may lie in the fact that the new law makes it the duty of the commission to require the carriers to earn a stated return on the investment. This gives the commission jurisdiction over minimum rates as well as maximum.

The peril in the cotton rate ruling, if it stands, is that hereafter when railroads attempt to make an

Figures for 1920 are not typographical errors. They tell, briefly and strongly, how great was the depression of last year. Some of the statistics were obtained by elimination and may differ slightly from those that might be obtained directly. During the six months, January to June, 1921, the following cotton movement was recorded: to the Orient via Panama, 174,041 bales; via San Francisco, 65,333; via Seattle, 86,410.

Some Recent History

Prior to the railroad rate increases of August, 1920, the Gulf and Pacific were on a parity with an aggregate cotton rate of \$1.70 to the Far East, the railroad differential being 40 cents in favor of the Gulf. Shippers recently sought a reduction of the export rate to the Pacific Coast from \$1.50 to \$1.25; but the railroads declined to grant \$1.25 because, in view of the 95-cent Gulf rate, the old 40-cent rail differential would have been destroyed, with the probable result that the Gulf railroads would have made a 10-cent reduction, leaving the relative status of the two coasts unchanged. A reduction of 15 cents,

however, or a restoration of the 40-cent rail differential, was granted. It is against this proposed rate of \$1.35 that Galveston is protesting to the Interstate Commerce Commission.

Protest of Seattle

The following telegram of the Seattle Port Commission to the Interstate Commerce Commission summarizes the contention of that port:

Concerning the suspension of the \$1.35 export rate on cotton via Pacific Coast ports, the Port of Seattle Commission desires to protest formally against the suspension. Besides forcing the movement of cotton through Gulf ports, causing congestion, shippers are handicapped, as they are compelled to assemble and

forward shipments from interior points twenty days earlier. The long route through the Gulf ports and the Panama Canal results in loss of interest and increased insurance. Shippers liable to suffer tremendous financial loss as a result of the rate suspension. On account of discrimination against Pacific ports in favor of Gulf ports, we respectfully urge your commission to reconsider and permit immediate reinstatement of the \$1.35 rate.

Page Freight Report

San Francisco, October 17, 1921.

Our last report was dated September 15. A fair amount of business has been done in grain freights to U. K. from Portland and Puget

Sound. The Northern Grain and Warehouse Company chartered the steamer Begonia No. 1 from Portland to U. K. on private terms, also Norwich City at 55¢ for one port, 56 2/3¢ for two ports of discharge. The Portland Flouring Mills chartered steamers Polyktor at 57 1/2¢, and Erviken at 56 3/4¢, also steamer Katherine Parke reported chartered by M. H. Houser on private terms. Balfour, Guthrie & Company chartered the steamer Anglo Chilean at 55¢ and the Ootmarsum at 57 1/2¢, and later the Japanese steamer China Maru at 55¢, with the option of sending her to Karachi with wheat at 50¢. The Gray-Rosenbaum Grain Company chartered the steamer Polar

United States imports and exports in long tons, year ended June 30, 1921.

	Imports.	Per-cent.	Exports.	Per-cent.	Total imports and exports.	Per-cent.
United States:						
Shipping Board.....	5,230,460	22	11,451,146	19	16,681,606	20
Privately owned.....	18,579,869	30	11,640,105	20	30,219,974	36
Total.....	23,809,329	72	23,091,251	39	46,900,580	52
Foreign.....	10,906,167	26	20,113,709	61	31,019,876	48
Grand total.....	34,715,496	100	43,204,960	100	77,920,456	100

Exports of United States ports, in long tons, year ended June 30, 1921.

Port.	Total trade.	Exports.	Percentage carried by—			
			Foreign ships.	United States independent.	United States Shipping Board.	
	Tons.	Tons.				
New York.....	21,140,122	11,842,143	58	22	20	
New Orleans.....	8,983,851	5,481,993	66	12	23	
Baltimore.....	8,896,213	5,946,738	66	9	26	
Norfolk.....	8,964,273	7,855,622	88	20	17	
Philadelphia.....	8,000,245	4,461,577	65	13	22	
Galveston.....	6,739,440	3,561,418	76	4	30	
Newport News.....	4,484,995	4,428,535	66	45	1	
Port Arthur.....	2,775,333	1,864,952	80	13	7	
Boston.....	3,061,071	711,708	64	9	17	
San Francisco.....	2,905,144	1,628,803	64	9	17	
Baton Rouge.....	1,553,901	835,472	39	53	6	
Seattle.....	1,213,133	730,294	48	22	30	

Imports of United States ports, in long tons, year ended June 30, 1921.

Port.	Total trade.	Imports.	Percentage carried by—			
			Foreign ships.	United States independent.	United States Shipping Board.	
	Tons.	Tons.				
New York.....	21,140,122	9,597,979	35	35	30	
New Orleans.....	8,983,851	3,801,858	31	49	20	
Baltimore.....	8,896,213	2,919,478	31	20	29	
Norfolk.....	8,964,273	2,116,649	44	33	21	
Philadelphia.....	7,406,345	3,144,708	27	42	31	
Galveston.....	6,739,440	4,428,535	67	14	19	
Newport News.....	4,484,995	2,211,291	10	76	7	
Port Arthur.....	2,775,333	2,240,361	30	47	23	
Boston.....	2,905,144	1,505,341	30	47	23	
San Francisco.....	2,905,144	1,015,472	18	64	18	
Baton Rouge.....	1,553,901	805,110	42	46	12	
Seattle.....	1,213,133	805,110	42	46	12	

On the left appear the Department of Commerce's report on United States imports and exports for the fiscal year ending June 30, 1921. The first twelve ports in volume of trade are shown in order. On the right are the next twenty-four ports. The department explains the relatively high percentage of imports carried by American vessels, 72 as against 39 for exports, to large shipments of oil brought in by domestic companies. Norfolk and Newport News rank high in aggregate commerce because of coal exports and Port Arthur because of oil shipments. Most of Galveston's imports was oil.

Exports of United States ports, in long tons, year ended June 30, 1921.

Rank by total trade.	Port.	Total trade.	Exports.	Percentage carried by—			
				Foreign ships.	United States independent.	United States Shipping Board.	
13	Los Angeles, Calif.....	1,045,476	738,281	22	42	36	
14	Portland, Ore.....	992,883	826,408	19	49	40	
15	Savannah, Ga.....	908,071	823,367	31	8	61	
16	Nabes, Tex.....	948,315	783,008	75	24	1	
17	Charleston, S. C.....	943,802	500,712	51	26	23	
18	Portland, Me.....	981,474	558,732	80	3	17	
19	Mobile, Ala.....	820,316	577,534	24	34	42	
20	Perth Amboy, N. J.....	758,368	614,844	46	45	9	
21	Jacksonville, Fla.....	620,862	533,134	33	3	64	
22	Tampa, Fla.....	801,782	287,102	35	4	11	
23	Key West, Fla.....	516,205	348,143	67	100	0	
24	Chesler, Pa.....	456,830	263,367	58	8	34	
25	Pensacola, Fla.....	420,714	320,211	76	18	25	
26	Houston, Tex.....	274,165	215,542	58	8	34	
27	San Luis, Calif.....	345,280	343,750	6	86	8	
28	Fall River, Mass.....	235,539	227,182	97	1	2	
29	Tacoma, Wash.....	303,386	174,399	57	7	36	
30	Brunswick, Ga.....	241,970	150,067	61	7	29	
31	Newark, N. J.....	225,662	62,296	5	85	10	
32	Freeport, Tex.....	215,727	14,724	12	87	0	
33	Wilmington, N. C.....	173,535	53,531	30	0	70	
34	Washington, Del.....	155,667	155,667	100	0	0	
35	San Francisco, Cal.....	131,921	399	0	100	0	
36	Gulfport, Miss.....	133,431	137,142	55	37	8	

Imports of United States ports, in long tons, year ended June 30, 1921.

Rank by total trade.	Port.	Total trade.	Imports.	Percentage carried by—			
				Foreign ships.	United States independent.	United States Shipping Board.	
13	Los Angeles, Calif.....	1,045,476	307,192	26	49	25	
14	Portland, Ore.....	992,883	42,478	12	17	71	
15	Savannah, Ga.....	908,071	408,144	32	38	30	
16	Nabes, Tex.....	948,315	150,347	16	87	0	
17	Charleston, S. C.....	943,802	136,090	14	9	77	
18	Portland, Me.....	981,474	330,723	31	36	33	
19	Mobile, Ala.....	820,316	262,763	32	39	29	
20	Perth Amboy, N. J.....	758,368	663,514	19	64	17	
21	Jacksonville, Fla.....	620,862	273,749	4	87	9	
22	Tampa, Fla.....	601,782	134,640	4	93	1	
23	Key West, Fla.....	661,306	263,367	18	8	74	
24	Chesler, Pa.....	456,830	191,452	1	96	3	
25	Pensacola, Fla.....	420,714	109,323	22	60	18	
26	Houston, Tex.....	274,165	136,090	1	8	91	
27	San Luis, Calif.....	345,280	265,539	77	25	0	
28	Tacoma, Wash.....	303,386	138,995	65	35	0	
29	Brunswick, Ga.....	241,970	82,993	34	17	49	
30	Newark, N. J.....	225,662	192,177	8	86	6	
31	Freeport, Tex.....	215,727	200,993	0	100	0	
32	Wilmington, N. C.....	173,535	120,221	34	17	49	
33	Washington, Del.....	155,667	155,667	100	0	0	
34	San Francisco, Cal.....	131,921	133,534	0	100	0	
35	Gulfport, Miss.....	133,431	16,292	29	71	0	

de Larrinaga at 56/3 for a cargo of wheat in bulk, and the same firm chartered the American steamers Hanley and Abercos at a reported rate of 60/, though we have heard since that the rate was really nearer 56/3. It will be remembered that these two steamers were chartered by the Admiral Line from the United States Shipping Board at 50 cents per ton per month on the deadweight, bareboat form of charter. The Norwegian steamer Strinda was reported chartered last week at 50/, from Portland to U. K., but apparently the charter fell through. P. N. Gray & Company of New York are said to have chartered the Norwegian steamer Torrey to Calcutta and Bombay at 52/6, or one port at 50/, with the option of Shanghai at 35/ per ton free discharge. From San Francisco only one charter is reported, namely, the Vic. de Larrinaga, to U. K. or Continent by John Westrope & Company. Previous to this, though not reported, Strauss & Company chartered the Ravenrock at 61/3, also the Spanish steamer Arno Mendi at 57/6—all three steamers for barley.

The lumber business has continued quiet, as the buying demand from foreign countries is not very good, with the exception of lumber cargoes to Japan from the North. Robert Dollar & Company are reported to have chartered four Japanese steamers at about \$14 per thousand. H. R. MacMillan & Company chartered one of the Canadian government steamers some time back at \$14 Canadian per thousand for ties to Taku Bar, and they have since chartered the British steamer City of Victoria in the same direction for a full cargo of ties at \$16 per thousand, Canadian currency. The same firm have chartered the barkentine S. F. Tolmie at \$15 Canadian for lumber to Japan, and the Pacific Export Lumber Company are reported to have chartered the Japanese steamer Yoman Maru for Japanese squares on private terms, and the American schooner Levi Ostrander for logs from Coos Bay to Japan at a lump sum said to be \$26,000. Dant & Russell, Inc., are said to have chartered the steamer Clyde Maru on private terms, also for logs from Portland to Japan. The steamers West Catanace, A. L. Kent and Felix Taussig have all been chartered in New York for lumber from the Pacific Coast to a port north of Hatteras, and the rates reported are \$16 for the first and \$15 for the last two. The schooner Fearless was chartered by A. F. Thane & Company for lumber to

Callao at \$18. No charters have been reported for lumber to Australia. The regular lines are taking lumber at prices which sailing ship owners declare they cannot afford to accept.

Some little stir and interest has been excited on the street in the charter by Messrs. Dant & Russell, Inc., of Portland, of the three well-known Nielsen steamers on time charter, government form, at \$1.10 per deadweight ton for one year, delivery and redelivery U. K., Continent. The above steamers have

No sailers have been fixed for Africa. The going rate is about \$25 per thousand.

PAGE BROTHERS, Brokers.

Beffuss Freight Report

San Francisco, October 24, 1921. Since our freight report of September 22, there has been a much healthier freight market. Although this has not manifested itself in many more fixtures of full cargoes, some few fixtures have resulted and the trans-Pacific trade shows a steadier firmness.

Grain to Europe is still taking its share of tonnage, but the number of fixtures is not so heavy as last month and no barley chartering has been done. The rates for wheat from the North are lower, most of the fixtures reported being at about 50/—.

Several steamers are reported at about \$14 with lumber to the Orient and four vessels are reported fixed on time charter at about 6/— for one year, and it is generally understood that these vessels will be used principally in the trans-Pacific lumber trade.

Several steamers have been reported taken for lumber for ports north of Hatteras at rates ranging from \$15 to \$17.

A full steamer cargo is reported to Australia at 80/—, but outside of this the Australian market has been quiet.

To West Coast South America the regular lines are taking parcels, but one full sailer cargo has been done at about \$18.

Several vessels are reported for copra from the South Sea Islands to San Francisco at about \$10.

C. BEYFUSS CO.,
BROKERS.

INDEX NUMBERS OF OCEAN FREIGHT RATES.

Month.	United States Atlantic ports—					
	United States	French Atlantic	Northern Europe and Belgium	Scandinavia	Med. Levant	All Europe
1920.						
January	100.0	100.0	100.0	100.0	100.0	100.0
February	98.5	98.5	98.5	98.5	98.5	98.5
March	97.0	97.0	97.0	97.0	97.0	97.0
April	95.5	95.5	95.5	95.5	95.5	95.5
May	94.0	94.0	94.0	94.0	94.0	94.0
June	92.5	92.5	92.5	92.5	92.5	92.5
July	91.0	91.0	91.0	91.0	91.0	91.0
August	89.5	89.5	89.5	89.5	89.5	89.5
September	88.0	88.0	88.0	88.0	88.0	88.0
October	86.5	86.5	86.5	86.5	86.5	86.5
November	85.0	85.0	85.0	85.0	85.0	85.0
December	83.5	83.5	83.5	83.5	83.5	83.5
1921.						
January	82.0	82.0	82.0	82.0	82.0	82.0
February	80.5	80.5	80.5	80.5	80.5	80.5
March	79.0	79.0	79.0	79.0	79.0	79.0
April	77.5	77.5	77.5	77.5	77.5	77.5
May	76.0	76.0	76.0	76.0	76.0	76.0
June	74.5	74.5	74.5	74.5	74.5	74.5

Index numbers of ocean freight rates, United States Atlantic ports to Europe, prepared by the division of analysis and research, Federal Reserve Board. Recent changes were regarded as of general interest, so a recent base was chosen, and January, 1920, was preferred over 1919 because during part of the latter year government control continued. The great changes in freight rates are due to the war between the French Line and the conference.

been arranged by Dant & Russell to bring three cargoes of Cardiff coal to San Francisco, the same having been bought by the King Coal Company. It is a long, long time since such cargoes have been shipped from the British Isles to this port, but it may well be that other steamers will be chartered for coal from Cardiff either to Honolulu or to this coast.

About People

Personals

Harold H. Ebey, district director of operations, Shipping Board, San Francisco, has resigned, effective October 31, to join Williams, Diamond & Company, general Pacific Coast agents of the American-Hawaiian. Mr. Ebey's scalp recently was sought by political Washington, but his record and protests of the Pacific American Steamship Association were efficacious in warding off dismissal. He will be in charge of operations of Williams-Diamond, although his familiarity with European-Pacific trade, gained during his Kosmos Line agency, would fit him equally well for the traffic depart-

ment. For four years Mr. Ebey was with the Shipping Board and was San Francisco director for three years.

Walter Gompertz, general manager of the Standard Coal Company, San Francisco, a bunkering company, has resigned to enter business on his own account.

Edgar McKee has been appointed president of the Los Angeles Harbor Commission.

Captains A. A. Langkilde and K. P. T. Woods have been appointed Columbia River bar pilots.

I. Abe, Portland manager of Suzuki & Company, is transferred to Seattle and is succeeded at Portland by H. Toda.

Alexander D. Fraser is now general agent of the North Atlantic & Western in the Middle West with headquarters in Pittsburgh. He will pay particular attention to steel shipments.

J. D. Dwyer has been promoted to be assistant freight agent of the Pacific Steamship Company, Seattle, succeeding Robert W. Heinsch, resigned.

Charles Donley will represent the Pacific Mail Steamship Company in the Pittsburgh and Wheeling districts with headquarters in Pittsburgh.

Edwin C. McLaughlin, superintendent of the White Star at Pier 60, New York, retired October 1 after 33 years of service.

George B. Green and A. M. Green, general manager and assistant general manager of the East Waterway Dock & Warehouse Company, Seattle, resigned, effective October 1.

R. C. Mason, secretary of the Rice Association of California, of the South Pacific Millers' Association, and of the Green Coffee Association of the San Francisco Chamber of Commerce, has resigned to become an official of the Pasadena Milling Company.

Captain Andrew Dixon, one of the founders of Struthers & Dixon, has retired from active business. In 1904 Captain Dixon became first officer of the old Pacific Mail steamship Mongolia; later was promoted to command of the Coptic, Korea, Siberia and Manchuria, the last of which he had when the fleet was sold in 1915. In October of that year he and Harry Struthers organized their firm.

Thomas James, who has been with Frank K. Hitching, agent of the Yamashita Kisen Kaisha, has been appointed assistant to J. V. C. Comfort, manager of the Pacific Mail.

Harry Kimball, former president of the Remington Arms Company and of other corporations, has been made financial vice-president of the Shipping Board in charge of the offices of the comptroller, treasurer, auditor and collector.

Sidney Henry, recently vice-president of the Baltimore Drydocks & Shipbuilding Company, is commercial manager of the Shipping Board with jurisdiction over shipyards, Hog Island included.

J. A. Roach, special agent, marine department of the London Assurance, San Francisco, has resigned and is succeeded by W. W. Tomlinson.

Edgar H. Lion has been placed in charge of the insurance department of H. M. Newhall & Company, San

Francisco, succeeding G. S. Pettis, resigned. Mr. Lion had been manager of the marine department.

R. B. Hooper, late of the adjusting department of Johnson & Higgins, Seattle, has been transferred to the San Francisco office.

Fred I. Tucker, of Boston, was appointed as manager of the plants division in the commercial manager's department of the Shipping Board October 11.

Deaths

Captain S. A. Hoyt, first port warden of Seattle, in Seattle October 6.

Robert J. Tyson, former president of the Seaboard National Bank, San Francisco, in Piedmont, California, October 13. He entered business in the marine department of the Fireman's Fund Insurance Company in

SUBCHASER NOW FISHERMAN
A VERY interesting addition recently made to the fishing fleets of San Diego is the converted subchaser Corona. The Corona has an over-all length of 110 feet, a beam of 15 feet 4½ inches, and a draft loaded of 5 feet forward and 6 feet aft. She was purchased in New York and was there equipped with two 100 horsepower Fairbanks-Morse crude oil semi-Diesel engines. On her trials she developed a speed of 14 knots an hour, her normal speed, however, being 12 knots.

She was brought around from New York to San Diego by Captain F. E. Davis, the actual running time being 21 days, a very good passage for such a boat, particularly as very rough weather was experienced in the Caribbean Sea. Captain Davis is very outspoken in his praise of the seaworthiness of this boat and of her capabilities in the fish carrier line.

She is being used for carrier work in connection with the fleets fishing for fresh fish for the San Diego and Los Angeles markets. Her engines have been functioning perfectly and at a fuel expense which is a small fraction of that for a gasoline-driven boat of the same dimensions.

New York Shipbuilding Corporation—A Record of Ships Built. An attractive book of 65 pages bound in green pressboard and profusely illustrated with samples of the work of the New York Shipbuilding Corporation.

The plant of this firm is without doubt the greatest single shipbuilding plant in the United States, if not in the world. This plant has a shipway capacity of 28 vessels at one time, together with ample outfitting basins and complete shop and

1885; became special agent in the fire insurance department; joined his brother, George H. Tyson, in the general agency of the German-American in 1891; and ten years later organized the firm of J. H. Tyson & Company. In May, 1905, he organized the Seaboard National Bank and was its vice-president until 1906, when he assumed the presidency. He is survived by his widow, two sons and a daughter; and by three brothers: George H. James, president of the Charles Nelson Company, and Mitchell, a San Francisco bar pilot.

Captain Alfred Kitts, formerly of the Pacific Mail, in Galveston October 13.

Captain William S. Daniels of the Standard Oil, in San Francisco October 15.

storage facilities. At one period the yard was actively at work on 43 ships on the ways and in the outfitting basins.

This yard undoubtedly has the most complete track and crane systems for tying the various parts of the plant together that have ever been installed in any shipbuilding plant. There are 115 cranes, varying in capacity from 1½ tons to 200 tons, and over 15 miles of standard gauge railroad trackage. The ways range in capacity up to ships of 1000 feet in length, and the foundations of the large ways are capable of taking the launching weight of the heaviest superdreadnoughts.

Practically every type of steamship built is illustrated in this book. The book commemorates the twentieth anniversary of the founding of the New York Shipbuilding Corporation, and it is shown that during the twenty years up to August 1, 1921, they have been responsible for the building of 265 vessels with a total displacement tonnage of 1,035,925 tons, a total length of 88,001 feet, and a total horsepower of 1,982,835. The total length of these ships is equivalent to 16 2/3 miles. In addition to the total horsepower of these vessels, the yard has built engines for ships elsewhere totaling 19,200 H. P.

The vessels built include passenger and cargo vessels, tank steamers, colliers, general cargo ships, battleships, battle-cruisers, light cruisers, destroyers, river passenger steamers, ferry boats, car floats, oil and coal barges, lightships, light-house tenders, fireboats, revenue cutters, dredges, mine planters, and pontoons. Fighting ships have been built for the navies of the following countries: United States, China, Greece, Japan and Argentina.

MACHINERY AND EQUIPMENT

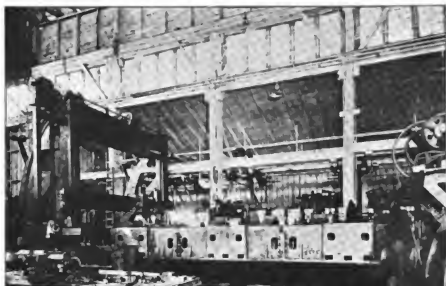
SHOP WORK ON LARGE ENGINES

Some Notable Tools in a Southern California Shipyard

WE illustrate herewith three rather notable examples of large planer work in the building of marine triple expansion engines in the machine shop of the Los Angeles Shipbuilding and Drydock Company.

The 12-foot planer, which is shown in one illustration operating on the bedplate, has a 24-foot 2-inch table, a width between housings of 12 feet 10 inches, and a height clear of 10 feet.

The bedplate shown is for the 3500 horsepower triple expansion marine reciprocating engine used in the freighters of the West Lewark class. This bedplate is 23 feet in length, 12 feet 6 inches wide, and 3 feet 3 inches deep, with a total weight of 60,000 pounds. It will be seen in the illustration that the bedplate is made in three sections. The joints between these sections are surfaced and the flanges held by through bolts fitted into reamed holes. The entire bedplate thus assembled is planed in one operation for the faces to receive the feet of the A-frames and columns.



Sixty thousand pound bedplate for 3500 I. h. p. marine engine on 12-foot planer

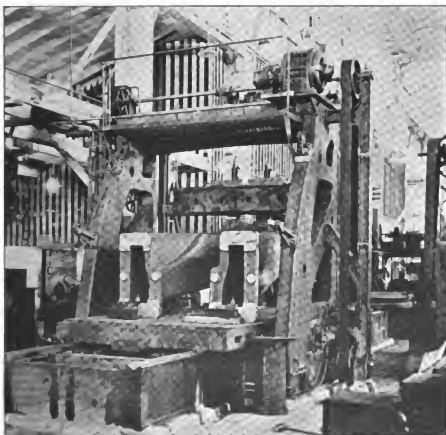


An A-frame is shown on the 10-foot planer, the guide faces for the crosshead guides being planed simultaneously by the two tool heads on the planer. The casting for this A-frame, which forms one of the back columns of the engine, weighs 10,400 pounds, has a height of 13 feet 2 inches, a width of 6 feet 6 inches, and a depth of 4 feet 6 inches. The illustration plainly shows the method of fastening this big casting on the platen.

This 10-foot planer, which was designed by the engineering staff of the Los Angeles Shipbuilding and Drydock Company and built entirely in the plant of that firm, has a 21-foot table, 10 feet clear width between the housings, and a clear height under the tools of 7 feet 6 inches. The illustration clearly shows the individual electric drive and the clever distribution of metal in the castings to equalize stresses and produce a rigid machine tool with the minimum weight.

The low pressure cylinders for these engines have a 78-inch bore which, combined with the 48-inch stroke, makes a very massive casting weighing in the rough 40,000 pounds and having over-all dimensions of 10 feet 8 inches in length, 8 feet 1 inch in width, and a height of 8 feet 2 inches.

The planer shown working on this



A-frame of 3500 I. h. p. marine engine on 10-foot planer at the shop of the Los Angeles Shipbuilding and Drydock Company

cylinder was also designed and built in the shops of the Los Angeles Shipbuilding and Drydock Company, a smaller sized planer which was on hand being used as a basis for the design and reconstructed to form the larger tool.

The excellent record made by the reciprocating engines built and installed by this yard in their own ships demonstrates the accurate work of these tools.

ANNOUNCEMENT

The Max Kuner Company have recently opened at Portland a branch of their Seattle firm, which will be located at 506 Spalding Building, where they will carry a full line of nautical instruments. All ship masters are invited to make this office their headquarters at Portland.

ELECTRICAL EXHIBIT

The American Engineering Company, Philadelphia, will confine its exhibit at the exposition of the Marine Equipment Association of America, to be held in New York November 14 to 19, to electrical deck and dock machinery, in view of the fact that the naval architects will specialize on electric propulsion and electric auxiliaries at their convention during the same week.



Low pressure cylinder 3500 i. h. p. triple expansion engine on 12-foot planer, Los Angeles yard

REPAIRS ON A TOWING MACHINE

THE ship repairing and engineering firm of Muir and Symon, Incorporated, has for a long time held an enviable reputation along the San Francisco waterfront in the solving of knotty shop problems. In fact, they acted as a "sheet anchor" in times of distress to many a puzzled mariner. This reputation harks back as far as the days of the old sailing ships when William Muir, Senior, was one of the best known shipsmiths on the Pacific Coast.

That Mooney and Young, who have recently purchased the shop and business of Muir and Symon, have also fallen heir to some of these problems and to much of the ingenuity with which they are solved, is evidenced by the accompanying illustration showing the methods adopted for the removal of a broken drum from the shaft of a towing machine.

A 5-foot gear wheel and a 2-foot 6-inch drum with flanges 4 feet in diameter were assembled on a 6-inch steel shaft, the drum and gear being held by two keys. Two powerful jacks were applied on the inside of the flange of the drum, the thrust being taken against the inner face of the gear. A heavy double strap

was placed against the end of the shaft and through bolts carried from the flange of the drum to this strap, enabling the machinist to apply great leverage in pulling and pushing at

the same time. The drum was thus quickly started from its seat on the shaft and in a very few moments the shop was ready to place a new drum casting.



Repair work on a towing machine in the shop of Mooney and Young, San Francisco. Since this photograph was taken, George A. Ames has acquired an interest in this firm, and a reorganization has been effected under the name of General Engineering Company. Details will be found elsewhere in this issue of Pacific Marine Review.

NEW POWER CROSS FEED FOR TURRET LATHE

A compact and neatly designed power cross feed to the cutoff slide, having many unique features, has recently been developed for the Nos. 2, 3, 4, 5 and 6 tilted turret lathes and screw machines manufactured by the Wood Turret Machine Company of Brazil, Indiana.

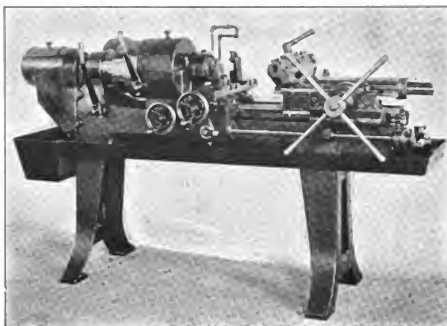
This design of power cross slide insures rigidity as well as permanent alignment of this part, as the apron or gear box is cast integral with the saddle.

The power is transmitted to the feed screw by means of two bevel gears on lower feed shaft meshing with a third gear on a vertical shaft, thence through helical gears to the feed screws.

One noteworthy feature is the single lever control which gives feed engagement in either direction by simply moving through three positions. When the lever is in a vertical position the feeds are disengaged. Throwing lever to the left engages the inward feed. Moving lever to right engages for feed outward.

Six feed changes, ranging from .003 inch to .023 inch per revolution of spindle are provided, any one of which is instantly available without stopping machine.

Provision is made to safeguard the feed mechanism against overload or accident by providing a brass shear pin on the lower feed shaft. This pin is easily replaced,



The Tilted Turret Lathe equipped with New Power Cross Feed for Cut-off Slide

should it become necessary, and as the element of safety gained is quite an item, this device is certainly worth due consideration.

A large dial is fitted on hand wheel which is graduated to .001. Provision is made for clamping the dial at any point.

The feed screw is provided with two bronze bearings in the outboard

end of slide, insuring stability, and a very ingenious method of taking up the back lash of feed screw is provided in a knurled adjusting nut which is locked by hand wheel.

The general aim throughout has been to obtain rigidity combined with a simple compact design that would offer an efficient and easily controlled feed mechanism.

TORCH-CUTTING CAST IRON

A 5-ton cast iron propeller hub was recently successfully cut in half with an oxyacetylene torch. The thickness of this casting ranged from seven to ten inches. Two cuts were made, each 40 inches long. No attempt was made to clean the casting, although it had been lying in the open for months and was covered with rust; nor did the operator preheat the hub preparatory to cutting. The photograph reproduced herewith shows how the job looked after successful completion. The work was performed at the shop of a large manufacturer of propellers, as a test of the cast iron cutting qualities of the torch—an Airco "D."

In a shop such as this the value of the cast iron cutting torch lies in its ability to cut up heavy cumbersome castings which for various reasons have been discarded and must be gotten out of the way.

The cost of cutting cast iron with the oxyacetylene torch is about five times that of steel, and, in this connection, the following data prepared



Cast Iron Propeller Hub of 5 tons' weight cut in two with Oxyacetylene Torch

by A. S. Kinsey, professor of shop practice, Stevens Institute of Technology, and advisory service engineer of the Air Reduction Sales Company, will be of interest to the man contemplating the use of an oxyacetylene torch for the cutting of cast iron:

"Steel 12 inches thick can be cut with oxygen and acetylene at the rate of about 30 square inches per minute, costing, say, 1.5 cents for labor, 10 cents for oxygen and 2 cents for acetylene, a total of 13.5 cents to cut 30 square inches per minute.

"Twelve-inch cast iron" (used in Professor Kinsey's experiments) "was cut at the rate of 7 square inches per minute, costing 1.5 cents for labor, 13 cents for oxygen and 4 cents for acetylene, a total of 18.5

cents to cut 7 square inches per minute.

"We may therefore calculate the following approximate figures on a basis of 100 square inches of metal cut:

To Cut by Hand Torch 100 Square Inches of Cast Iron and Steel with Oxygen and Acetylene

Material	Consumption		Operator's Time	Cost		Total
	Time Minutes	Oxygen cu. ft.		Oxygen	Acetylene	
Cast iron	15	123	.22	\$1.84	\$.56	\$2.62
Steel	3.5	25	.06	.37	.05	.48

While the above figures show the relative cost of cutting cast iron and steel with acetylene torch to be high for cast iron, it is fair to note that the only other way to cut cast iron, i. e., by machinery, would cost at least twice as much as cutting it with the torch. For example, a slab of cast iron costing \$2.62 per 100

square inches to cut off with the torch would cost if cut by machinery at least \$5.00 for labor and power if the casting were of convenient size to handle. However, the cost might be double that amount for

machining a big, unwieldy casting. We may therefore summarize:

Comparative Cost of Cutting 100 Square Inches of Metal		
Metal	Method	Cost per 100 sq. in.
Cast iron	by oxyacetylene torch	\$0.48
Cast iron	by oxyacetylene torch	2.62
Cast iron	by machinery	5.00

MACHINING PIPE FITTINGS

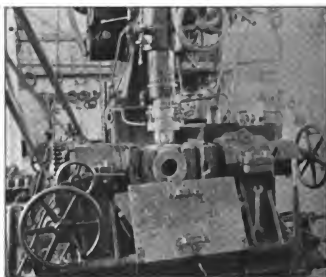
Some Interesting Methods in San Francisco Shop

THE Pacific Foundry Company of San Francisco has adopted as one of its specialties the manufacture of pipe fittings. Its line includes standard and heavy hydraulic fittings, both flanged and threaded, in all the various sizes of elbows, flanges, crosses and tees. In order to facilitate a production of threaded fittings, this firm has installed a complete set of Murchey collapsible taps, ranging in size from 1 to 10 inches and comprising a total of 24 taps.

Our illustration shows one of these taps in use in a Baker upright drilling and tapping machine. The special trunnion fixture for holding the fitting, which will be seen in the cut, was designed and built in the shop.

In this fixture there are two heads adjustably mounted on a table and movable along a dovetailed guide by means of adjusting screws operated by hand wheels. These heads carry large spindles to receive special chuck jaws for gripping the work. One spindle can be operated longitudinally by a hand wheel to grip or release the work at will. The other spindle is fitted with a worm gear mechanism for the rotation of the spindles and work and with an index plate to indicate the angle of rotation. The chuck jaw blocks on the spindles are arranged to receive special jaws made to suit the various fittings to be held. The fixture is designed with a capacity for fittings up to 16 inches.

In order to facilitate work with this same machine the engineering staff of the Pacific Foundry Company designed a special facing head for surfacing the face of flanged fittings as they were held in the special fixture. This head consists of a rectangular body mounted directly on the vertical spindle of the ma-



Tapping fittings in special trunnion fixture designed by staff of the Pacific Foundry Company, on a Baker upright drilling machine

chine and carrying two facing cutters which overlap each other by about three-eighths inch in the circular path around the work. A gear ring is carried on this rectangular body and connected by suitable shafting and spur gears to the longitudinal feed screw so that the revolving cutters are traversed across the face

of the work at the rate of about one-quarter inch per revolution. The depth of cut is generally about 3/32 of an inch.

The table holding the special chucking fixture can be raised or lowered by four 4-inch pneumatic cylinders located under the corners, the range of lift approximating 8 inches.



Pacific Marine Review

The Naval Magazine of the Pacific

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Pacific Marine Review

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MAKING THE GOLDEN GATE

This reproduction from a photograph by Gabriel Moulin of a painting by William Coulter, both of San Francisco, shows the four-masted American sailing ship Edward Sewell running into San Francisco harbor before a northwest trade wind.

This fine steel sailing ship was built in Bath, Maine, in 1899 by Arthur Sewell & Company. She is 312 feet long, 45.3 feet beam, and 28.3 molded depth. Her gross registered tonnage is 3706.

Pacific Marine Review

The National Magazine of Shipping

December, 1921

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HOW CAN AMERICAN SHIPS COMPETE?

An Expert Analysis of the Problems Facing Our Merchant Marine in Foreign Trade

By WINTHROP L. MARVIN*

HOW can American ships compete successfully with foreign ships? It is a far-reaching question that is stated in these words, a question that goes right to the root of the life of our present-day merchant marine. For unless American ships can compete successfully with the ships of foreign nations, which still manage to dominate our own overseas carrying, there can be no future for ocean shipbuilding and navigation under the American flag.

Therefore this question is one of as direct personal interest to naval architects and marine engineers of all grades and ratings in their profession as it is to the shipowners and managers themselves. The future livelihood and success of thousands of energetic and ambitious Americans hang upon a right solution of the problem of the ship in service.

Three main causes well known to men of our maritime industry were responsible for the inability of successful competition under the American flag with foreign ocean shipping previous to the great war.

Early Protective War Policy

For more than a hundred years the privilege of wearing American colors had as a general policy been reserved to ships of American construction. Coupled with this reservation, in the earlier years of our national life, was a vigorous national policy of encouragement to American ships—the discriminating duty policy, so called—which absolutely guaranteed to these ships a strong preference in employment. Under this policy, not completely abandoned until 1850 against our chief competitor, Great Britain, the requirement that American ships must be built solely in American yards was by no means an actual handicap. The building of wooden-hulled sail ships for a hundred and fifty years before the founding of our Federal government had been a firmly established and successful industry in North America. Materials were abundant and relatively cheap, and the skill of our builders was unsurpassed—indeed unequalled. No American merchants of that era desired to purchase or use foreign-built ships, for there was generally no advantage in securing vessels from abroad.

While wooden sail ships were carrying the commerce of the world, this requirement that vessels of the United States should be American-built was a just and prudent policy for the republic. This policy was not substantially weakened or abandoned until the Panama Canal Act of August 24, 1912, which for the first time in a general measure permitted the registry of foreign-built vessels for the purpose of engaging in the overseas trade but not in the coastwise trade.

Sail to Steam

Because of the absolute lack from 1860 onward of

any comprehensive encouragement for the employment of American vessels in other than our coastwise commerce, there was only scant, precarious demand for the construction of such vessels, and American ocean shipbuilding became a weakened industry. I have long been convinced that in past discussion of the decline of the American overseas marine altogether too much emphasis has been placed upon the change from sail to steam and from wood to iron and then to steel. It is true that, in the period from 1840 to 1860, the British iron industry was greater than our own. British machine shops and steam shipyards were mightily encouraged and strengthened by the generous British policy of mail shipping subsidies, initiated in 1840 and maintained with vigor and persistence until competing American steam services were driven from the seas.

But American shipowners and builders were by no means so unmindful of the advantages of steam propulsion and iron hulls as some of the commentators upon the fate of our ocean shipping have contended. The iron propeller steamer *Bangor* was built on the Delaware in 1845, a thoroughly efficient vessel for that period. In the years between 1850 and 1861 good iron steamers were built on the Delaware, at New York, and at Boston. Indeed, good American iron was found to be superior for shipyard purposes. The United States possessed admirable iron works and a substantial body of highly skilled mechanics, as was to be demonstrated later by the rapid and successful building of a fleet of monitors that proved a decisive factor in the Civil War. Not only monitors but broadside armorclads and iron cruisers were constructed in this country in the Civil War period, and a vast impetus was given to boiler and engine-making establishments at the Northern seaports by the swift creation of a new fleet of the six hundred war steamers that constituted in 1865 the most modern and formidable navy in the world.

All these facilities for the building of steam, iron, seagoing merchant ships could readily have been turned to the construction of a new merchant tonnage in 1865 and after if there had been any positive aid and encouragement to the successful operation of these American ships after they were completed. But though the dominant Republican administrations of that period wrought a gigantic success in the protection and development of the manufacturing industries of the country, the overseas shipping trade of the United States was left wholly without any equivalent encouragement. What was more natural and inevitable, therefore, than that manufacturing should flourish and ocean shipping still further decline through those years when Great Britain, thanks to the depredations of Anglo-Confederate cruisers, had dealt a terrible blow to our sail tonnage and had possessed herself of that lion's

* Read at the twenty-ninth general meeting of the Society of Naval Architects and Marine Engineers, held in New York, November 17 and 18, 1921.

share of our overseas carrying which she retained up to the outbreak of the great world war?

American Iron Shipbuilding

Without protection to the operation of American ships, the continued protection to the building of such ships of course proved wholly ineffective. Though iron ship construction, particularly in the Delaware district, made respectable progress in the years following the Civil War, these new iron steamships were designed for the protected coastwise trade, except for a few large passenger and mail steamers for the Pacific Mail, four excellent trans-Atlantic liners for the Philadelphia and Liverpool service of the old American Line, and other good but smaller steamers for the nearby West India services.

Under the sharply contrasting conditions wherein British yards were building in swift succession twenty iron steamers while our yards were building one—that is to say, while British yards were steadily manufacturing ships and our yards were producing irregularly a slender tonnage—what was more natural than that we should be seriously handicapped by a wide difference in the relative costs of construction? When in 1904-5 the Congressional Merchant Marine Commission under President Roosevelt made a careful survey of shipbuilding prices in this country and in Europe, the commission was constrained to report that steel steamships of the passenger and cargo type were costing from 40 to 45 per cent more on this side than on the other side of the Atlantic. Under the circumstances, with no aid or protection whatsoever for American shipowners and operators, it was hopeless to dream of employing any considerable numbers of American-built ships in overseas commerce.

Construction Cost Handicap

How heavy was that handicap can be demonstrated by a comparison of the capital charges of a British-built ship produced at a price of \$500,000 and an American-built ship produced at a price greater by 40 per cent, or of \$700,000:

	British ship \$500,000	American ship \$700,000
Interest, 5 per cent.....	\$ 25,000	\$ 35,000
Insurance, 4 per cent.....	20,000	28,000
Depreciation, 5 per cent.....	25,000	35,000
Total.....	\$ 70,000	\$ 98,000

Here, without any allowance whatever for the higher American wage costs of operation, is a difference in the main capital or carrying charges of \$28,000 a year, or in itself a fair rate of dividend upon the total cost of the British-built vessel. This fact alone would suffice to bar the American ship from competition.

Wages and Maintenance

Moreover, the wages and maintenance of the officers and men of the American steamer were at least 50 per cent greater than the wages and maintenance of the officers and men of the British steamer—a factor important of itself though of far less consequence than the handicap due to the higher cost of building as outlined above. It is not at all strange that from the building of the Ohio and her sisters for the Philadelphia American Line in 1873 the Stars and Stripes flew above no new American-built steamers exclusively employed in trans-Atlantic trade until the keels of the St. Louis and St. Paul were laid by the power of a special mail subsidy in 1894 and 1895. Between far higher costs of original construction and higher costs of crew wages and maintenance, rivalry with Euro-

pean ships, often state-aided as they were, was accepted by American shipowners as impossible.

When the shrewd diplomacy of Europe from 1815 onward had succeeded in enmeshing our government in treaties that gradually prevented us from encouraging our ships through the historic policy of discriminating customs duties and tonnage dues, our competitors overseas lost no time in launching out on a new and effective expedient of their own—mail and admiralty subsidies and subventions. The first sustained British trans-Atlantic steam service was created in 1839 by the grant of a mail subsidy of \$425,000 a year to what is now world famous as the Cunard Company of England. Other subsidies, even larger in amounts, called into being the Peninsular & Oriental Line to India, the Royal Mail Line to the West Indies and South America, and other British concerns, until finally thirty national steamship services reached all quarters of the world. France quickly followed suit. Germany put the powers of state aid, though in other forms than subsidy, behind the North German Lloyd and the Hamburg American. Our own Congress, in a fitful way, beginning with 1847, granted liberal mail pay to especial new American ocean steam lines, the best remembered of which are the Collins Line to Europe and the Pacific Mail to the Isthmus of Panama and on the Pacific Ocean. But while other nations were united in loyal zeal for the national interests, it happened, unfortunately for us, that this new and crucial steamship competition fell in a period that saw America rent by the sectional quarrels immediately preceding the Civil War. Southern statesmen, who at first had borne a full share in urging encouragement to our own national mail lines, turned against them when they saw how swiftly these new lines were upbuilding the sea power of the North. In the very crisis of the struggle between our American lines and their European competitors, a hostile Congress, dominated by sectional prejudices, struck down the American mail subventions and thereby destroyed every one of the American steamship services in the trans-Atlantic trade.

At this time the American Collins Line, with the largest and swiftest ships, was receiving a subsidy of \$858,000 a year, and the rival Cunard Line \$856,871 for smaller and inferior steamers. Soon after the Collins Line was killed by the act of our national lawmakers the Cunard mail pay was reduced by Parliament, demonstrating clearly that it was an aggressive fighting subsidy and nothing else.

But the British and other European policies of generous aid to national shipping lines, and thereby to steamship building and navigation, continued steadily without a break. It is sometimes urged that these governmental aids were not applied to "tramp" steamers. Directly they were not until France and Italy began to subsidize their entire shipping forty years ago. But, as a matter of fact, in a broad, true sense these European subventions and other assistances in those earlier years did quicken and strengthen the then new arts of iron steam shipbuilding and boiler and engine building in such a way that even the tramp steamers that came afterwards were indirectly the beneficiaries of the system. Moreover, the subsidized national mail lines pioneered and created commerce, a part of which the tramps subsequently carried.

Until the United States, in the Ocean Mail Act of 1891, tardily renewed the subsidy system in America, the decline of our own shipping remained constant. This ocean mail law, though sadly crippled by western agricultural opposition in its passage through the House of Representatives, did set the American flag

again afloat on the great route across the western ocean and did permanently strengthen our steamship communications with the West Indies, nearby South America and Australasia. Services subsidized under the ocean mail law owned almost all the steam tonnage we had in ocean commerce when the great world war broke upon us in midsummer of 1914.

Present Condition

Turning from this survey of the past to the new present, what do we discover? Is there no more hope for successful American competition with foreign shipping than there was before the late great war?

For one thing, America has now what before the war it did not have—a large, actual, seagoing merchant tonnage available for immediate employment in overseas carrying. It has the ships and it also has the managers, the operators, the officers and the men. It is now conveying about one-third of our imports and exports, or three times the proportion of before the war. Moreover, the American people, even to a degree the long-indifferent half-Teutonic Middle West, have been shocked by the war into a realization that, for peace or war, a strong merchant shipping is absolutely indispensable to America.

The nation has 8,000,000 gross tons of newly acquired merchant vessels on its hands, ships in which all the American people are stockholders. These stockholders are unitedly determined that our ships worth having shall not pass out from under the American flag. Any political clique or party that consented to haul down the flag would be committing instant suicide.

So the general outlook of the present is immensely more favorable than that of before the war for the development of a great ocean shipping and shipbuilding industry. But the obstacles in the way are substantially the same obstacles—the higher cost of operation and perhaps of construction of American vessels, the fact that even now our foreign competitors are in possession of two-thirds of the field, and the further fact that these foreign competitors in some way or to some degree are all powerfully upheld by the active aid of their own governments.

Comparative Building Costs

It is not now possible to speak definitely and with

authority as to the comparative cost of building ocean ships in America and in Europe. But it is true that shipowners who have made inquiry on the other side within recent months have found that British shipyard prices were lower than American prices by at least a margin due to the abnormal state of sterling exchange. On the other hand, the American yards could offer quicker completion and delivery, which in normal times is of itself a marked advantage. Altogether it will probably be found, when conditions in America and in Europe have again settled down, particularly with "tramp" cargo vessels, that foreign ship prices remain lower than our own, though by a narrower margin than before.

As to the costs of operation involved in at least the wages and maintenance of the crews, Europe retains an undeniable advantage as contrasted with America. The La Follette Seamen's Law, whatever else it may have done, has conspicuously failed to equalize sea-wage conditions around the world. Individual foreign seamen have quit foreign vessels in our ports and have reshipped on other vessels at the American wage scale. But this process, though not without significance, has not of itself brought foreign wage scales, as a whole, up to American wage scales, as is demonstrated by the following comparative payrolls of American, British, Japanese and Norwegian cargo steamers of like character and tonnage previous to May 1, 1921:

On May 1 last the pay of engineers, sailors, firemen and stewards on American merchant vessels, government owned and privately owned, was reduced by an average of about 15 per cent. The ensuing strike was quickly and easily won by the Shipping Board and private shipping companies. On August 1, 1921, the pay of the deck officers of American merchant vessels was reduced about 15 per cent, so far as mates were concerned. The pay of masters, with their greater responsibility, was reduced less, or not at all. Early in May a reduction in the wage scale of British officers and men became effective without a general strike.

Reductions in an equal or greater ratio have since become operative among officers and men of the Norwegian and Japanese merchant services, but the data for exact comparison with American schedules have

Crews for and Monthly Wages, Single Rates, Coal Boring Corp. Ship, Atlantic and Gulf Coast, 1920 (See Description) Line 10.

Atlantic				
Dept. Department	No.	Wages	Amount	Total
Master	1	\$57.10	\$57.10	
First officer	1	22.75	22.75	
Second officer	1	18.00	18.00	
Third officer	1	15.00	15.00	
Engineer	1	100.00	100.00	
Chief engineer	1	50.00	50.00	
Steward	1	10.00	10.00	
Stewardess	1	10.00	10.00	
Boiler room	1	10.00	10.00	
Galley	1	10.00	10.00	
Chief cook	1	10.00	10.00	
Second cook	1	10.00	10.00	
Third cook	1	10.00	10.00	
Fourth cook	1	10.00	10.00	
Fifth cook	1	10.00	10.00	
Sixth cook	1	10.00	10.00	
Seventh cook	1	10.00	10.00	
Eighth cook	1	10.00	10.00	
Ninth cook	1	10.00	10.00	
Tenth cook	1	10.00	10.00	
Eleventh cook	1	10.00	10.00	
Twelfth cook	1	10.00	10.00	
Thirteenth cook	1	10.00	10.00	
Fourteenth cook	1	10.00	10.00	
Fifteenth cook	1	10.00	10.00	
Sixteenth cook	1	10.00	10.00	
Seventeenth cook	1	10.00	10.00	
Eighteenth cook	1	10.00	10.00	
Nineteenth cook	1	10.00	10.00	
Twentieth cook	1	10.00	10.00	
Twenty-first cook	1	10.00	10.00	
Twenty-second cook	1	10.00	10.00	
Twenty-third cook	1	10.00	10.00	
Twenty-fourth cook	1	10.00	10.00	
Twenty-fifth cook	1	10.00	10.00	
Twenty-sixth cook	1	10.00	10.00	
Twenty-seventh cook	1	10.00	10.00	
Twenty-eighth cook	1	10.00	10.00	
Twenty-ninth cook	1	10.00	10.00	
Thirtieth cook	1	10.00	10.00	
Total crew	30	Total wages per month	\$2,511.00	

British				
Dept. Department	No.	Wages	Amount	Total
Master	1	100.00	100.00	
First officer	1	40.00	40.00	
Second officer	1	30.00	30.00	
Third officer	1	20.00	20.00	
Engineer	1	70.00	70.00	
Chief engineer	1	35.00	35.00	
Steward	1	10.00	10.00	
Stewardess	1	10.00	10.00	
Boiler room	1	10.00	10.00	
Galley	1	10.00	10.00	
Chief cook	1	10.00	10.00	
Second cook	1	10.00	10.00	
Third cook	1	10.00	10.00	
Fourth cook	1	10.00	10.00	
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Fourteenth cook	1	10.00	10.00	
Fifteenth cook	1	10.00	10.00	
Sixteenth cook	1	10.00	10.00	
Seventeenth cook	1	10.00	10.00	
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Twenty-first cook	1	10.00	10.00	
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Twenty-sixth cook	1	10.00	10.00	
Twenty-seventh cook	1	10.00	10.00	
Twenty-eighth cook	1	10.00	10.00	
Twenty-ninth cook	1	10.00	10.00	
Thirtieth cook	1	10.00	10.00	
Total crew	30	Total wages per month	\$2,511.00	

Japanese				
Dept. Department	No.	Wages	Amount	Total
Master	1	200.00	200.00	
First officer	1	100.00	100.00	
Second officer	1	80.00	80.00	
Third officer	1	60.00	60.00	
Engineer	1	100.00	100.00	
Chief engineer	1	50.00	50.00	
Steward	1	10.00	10.00	
Stewardess	1	10.00	10.00	
Boiler room	1	10.00	10.00	
Galley	1	10.00	10.00	
Chief cook	1	10.00	10.00	
Second cook	1	10.00	10.00	
Third cook	1	10.00	10.00	
Fourth cook	1	10.00	10.00	
Fifth cook	1	10.00	10.00	
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Seventh cook	1	10.00	10.00	
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Fourteenth cook	1	10.00	10.00	
Fifteenth cook	1	10.00	10.00	
Sixteenth cook	1	10.00	10.00	
Seventeenth cook	1	10.00	10.00	
Eighteenth cook	1	10.00	10.00	
Nineteenth cook	1	10.00	10.00	
Twentieth cook	1	10.00	10.00	
Twenty-first cook	1	10.00	10.00	
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Twenty-sixth cook	1	10.00	10.00	
Twenty-seventh cook	1	10.00	10.00	
Twenty-eighth cook	1	10.00	10.00	
Twenty-ninth cook	1	10.00	10.00	
Thirtieth cook	1	10.00	10.00	
Total crew	30	Total wages per month	\$2,511.00	

These three tables, when compared, show very graphically the wage handicap of the American ship operator

Grade	American	British		
		£	£ at \$4.35	£ at \$4.00
First officer	\$185.00	26/10	\$124.79	\$106.00
Second officer	170.00	21/10	104.49	86.00
Third officer	150.00	17/10	85.05	70.00
Carpenter	85.00	14/10	70.47	58.00
Boatswain	90.00	13/10	65.61	54.00
Able seaman	72.50	11/-	53.46	44.00
Ordinary seaman	52.50	7/10	38.45	30.00
Chief engineer	285.00	35/10	175.53	142.00
First assistant engineer	195.00	26/10	124.79	106.00
Second assistant engineer	170.00	21/10	104.49	86.00
Third assistant engineer	150.00	17/10	85.05	70.00
Dockerman	40.00	12/10	45.61	34.00
Oiler	80.00	12/-	68.18	52.00
Water tender	40.00	12/-	45.18	32.00
Fireman	75.00	12/10	60.75	50.00
Cool power and water	65.00	12/-	56.32	48.00

*Clam C, from 7,501 to 12,000 power tonnage—gross tonnage plus indicated horsepower.
Comparison of American and British wage scale at present exchange and at par

not yet reached the United States. It can be said, however, that America is now paying wages far higher than those granted by any competing nations, and that the cost of food or maintenance is also markedly higher, so that in this respect there is no important change whatsoever from the economic conditions that prevailed before the great war. Sea pay, which rose during the war in Europe as well as in America, has since been somewhat reduced in Europe as well as in America, so that the difference between American ships and foreign ships in wage cost and operation remains substantially the same as it was before.

In fact, allowing for abnormal conditions of international exchange, the wage handicap against American ships is greater than ever. Foreign steamers plying in American trade demand their freight or charter hire in American money, but buy their supplies as far as possible and pay the wages of their crews in their own depreciated currency. The result is astonishing. A case just reported to the American Steamship Owners' Association is that of a Norwegian steamer of a deadweight capacity of 11,000 tons. Her total cost of crew, including officers as well as men, per month, taking the kroner at 12.65 cents, is \$1613 a month, while the total cost of crew of a submarine boat type steamer, with a deadweight capacity of 5350 tons, is \$3302 a month.

Of course the abnormal difference in cost of operation, due to the present state of international exchange, is temporary; it will not last forever. But for the time being it has the practical effect of a profound discouragement to American shipping and of an actual subsidy to foreign shipping which will have to be met in some thoroughly effective way if American shipping is to live through the crucial ordeal of the three or four years to come.

Wages and maintenance together make up about 15 per cent of the total operating costs of a modern freight steamer. The present cost of wages and maintenance to our British and Norwegian competitors, largely because of upset rates of exchange, is nearly or substantially one-half our own cost. This exceptional difference, of course, will tend to decrease as

financial conditions are restored, but for the present this extra cost of wages and maintenance is a grave handicap to American shipping in a period of unprecedented intensity of competition. The difference in wages and maintenance is all the heavier a handicap on the new American merchant marine because America still lacks the well-coordinated mercantile and maritime organization all over the world which enables British shipowners to meet the competition of continental nations having wage rates still lower than the British scale. The effect of this close British co-operation in every country, in every trade and in every port, of British agents, merchants and bankers in enforcing preference for British ships, makes that shipping in effect one of the most thoroughly protected industries of which there is any record in commercial history.

Egyptian Cotton

An excellent case in point has just been afforded in the effort of the United States Shipping Board to secure for American ships the carrying of Egyptian cotton from Alexandria to this country. American cotton mills are liberal users of the Egyptian fiber, practically every pound of which has for years been brought to the United States, either directly from Egypt or via the United Kingdom, in British steamers, through a close working agreement between cotton merchants in Egypt and the Liverpool conference lines.

When American steamship companies a year ago sought for their own vessels a share of the carrying of Egyptian cotton destined for the United States, their officials were told that this had been and would continue to be a British monopoly, and American vessels could not hope to have any share in it. For the time being the effort had to be abandoned, but last spring the Shipping Board forced the issue by offering a freight rate of 40 shillings a ton for Egyptian cotton brought to the United States and of 25 shillings a ton to the United Kingdom, while the bid of the Liverpool conference lines was respectively 60 shillings and 40 shillings per ton.

British Methods

Yet so hard and fast was the combination which British merchants and shipowners had effected to monopolize the Egyptian cotton trade that the lower bids of the Shipping Board were immediately rejected, and rejected with the approval of the Liverpool and Manchester cotton exchanges. The characteristic intensity of the devotion of British merchants to their own country's shipping is shown in the insistence of these British business men in handling Egyptian cotton in their own country's ships, though it cost them a far greater price than if carried in American vessels. At last accounts the United States Shipping Board had been unable to obtain any concession whatsoever of any share of this American carrying trade, and the case was being transferred to the Department of State for diplomatic action.

From instances like these Americans can gather something of the exclusive, arbitrary methods by which Great Britain has developed her immense merchant marine, and something of the difficulties beyond mere wage scales which we must meet if we are to wrest from British carriers any part of the transportation to the United States of imports which American merchants and manufacturers have purchased.

All over the world British manufacturers and merchants and their representatives will be found demanding that British ships must secure all the cargoes which they can manage to control. There must be similar tenacious organization and co-operation of

American manufacturers and merchants in the interest of their own country's ships and their own country's flag if our new merchant marine is to have the even chance to which it is honestly entitled.

Foreign Subsidies

Another important factor in the maritime situation, beyond the lower wage and maintenance cost of foreign ships and the disciplined activity of our competitors, is the generous direct or indirect national aid extended by all governments, particularly to their regular line steamship services. Just before the great war the United States Commissioner of Navigation published an analysis of the subsidies, subventions and bounties then being paid to the steamship interests of the world's chief maritime nations. These sums aggregated about \$46,000,000 a year, of which Great Britain's own share was approximately \$10,000,000. While the British and the Germans at that time gave direct state aid only for mail, passenger and fast freight services, it was significant that other governments, notably France, Italy and Japan, were subsidizing virtually their entire merchant marines and even giving direct bounties to shipbuilding.

As rapidly as possible, these subsidies, subventions and bounties are now being re-established—they were not necessary during the continuance of the war. It is probable that when the total sums of these state expenditures are again recorded they will be found amounting to a great deal more than \$46,000,000 a year, for the war itself most vividly emphasized to all governments and all peoples the tremendous value, indeed the imperative necessity, of a strong commercial shipping for defensive and commercial purposes.

The Necessary Factors for Successful Competition

What the American people must, therefore, prepare to do to enable American merchant ships to compete successfully with the ships of foreign nations is: (1) To find the most practicable form of equalizing American sea wages and costs of maintenance with the wages and costs of maintenance of foreign ships, by a system of preferential duties or subsidies and subventions, or some other still more effective method, if that can be found; (2) of organizing American manufacturers, merchants and bankers into a league as disciplined and powerful as the similar British league, for example, for securing the carriage of a greater share of our imports and exports to American ships;

(3) of offsetting foreign subsidies, subventions, bounties and like national assistance given to the ships of our competitors. In addition, if it is discovered that the first cost of American-built ships is greater than the first cost of foreign-built ships, there must be full compensation for this factor also. In other words, the American merchant marine must be made what it has not been for more than sixty years, a nationally protected industry, as for most of the life of this republic manufacturing and agriculture have been protected industries. These things must all be done, or the new American merchant fleet, which is even now being beaten off the ocean by its competitors, will inevitably again decline and disappear exactly as the old merchant marine was declining from 1855 onward.

Moreover, it is essential that the classification and survey of American merchant shipping in the years to come be controlled by interests 100 per cent American. The success of the American Bureau of Shipping is absolutely essential to the prosperity and security of the new American merchant marine which must also find in American hands the resources for a major part of the underwriting of the ships themselves and of their cargoes. Only the other day British marine insurance companies were assisting the Liverpool conference lines to retain complete control of the Egyptian cotton trade by allowing British ships much lower insurance rates on cotton cargoes than were being granted to American ships. The protective value of classification, survey and insurance of our own is a point that cannot possibly be over-estimated in any study of the future of the American merchant marine.

American shipowners must develop, as rapidly as possible, what their fathers possessed before them, a corps of the most efficient seagoing officers in the world, every one an American citizen, and the largest possible number of citizen seamen. The American people will never consent to protect and encourage American shipping as it must be protected and encouraged so long as any substantial proportion of that shipping is officered and manned by alien subjects of foreign countries, our rivals in trade and possible enemies in war. Who can justify a merchant marine as a naval reserve unless it is securely held in loyal hands, and not in the hands of those who in an hour of need might betray it to the enemy?



OUR GREATEST WOODEN SHIP

The clipper ship *Great Republic*, whose history is recorded in the accompanying article by F. C. Matthews, was considered by Donald McKay to be his great masterpiece. Below are given some comparisons as to her size and carrying capacity.

McKay was a great exponent of the hollow wave line and made of the underwater bodies of his clipper model ships poems in wood which have been beautifully described by Longfellow.

"Broad in the beam. That the stinging blast
Sweeping down upon sail and mast
Might not the sharp bows overwhelm.
Broad in the beam. Yet sloping aft
With a graceful curve and slow degrees

That she might be docile to the helm,
And that the currents of parting seas,
Meeting behind with a mighty force,
Might and not impede her course."

We of today design and build beautifully modeled racing yachts with which we go into international regattas and reel off lively races, making speeds as high as 8 knots an hour sometimes for a few minutes. Here was a ship that with 5000 tons (weight and measurement) in her ample hold reeled off 19 knots an hour for nineteen hours at a stretch. Are we not right in saying that she was in deed and in truth a masterpiece in wooden shipbuilding?

THE following table gives some of the principal dimensions of hull and rigging of the *Great Republic* (as she was before being burned) and the four-masted wooden ship *Shenandoah*, built by Arthur Sewall & Company at Bath, Maine. The first four-master to appear after the launch of the *Great Republic* was the *Ocean King*, a Kennebunkport ship; the next was the *Frederick Billings* from the Rockport yard of Carleton, Norwood & Company, and then followed the *Rapahannock* and *Shenandoah*:

Name	<i>Great Republic</i>	<i>Shenandoah</i>
Launched	Oct., 1853	Nov., 1890
Tonnage	4555	3258
Capacity	6000	5000
Dimensions	335x53x38	299x49x28
Length mainmast	131	89
Length main top mast	76	56
Length main topgallant mast, etc.	81	69
Length spanker mast	110	96
Length spanker top mast	40	82
Mainyard	120 ft. x 28 in.	92 ft. x 22 in.
Lower maintop sail yard	92 ft. long	84 ft. long
Length main skysail yard	40 ft.	46 ft.
Length spankerboom	40 ft.	56 ft.
Bowsprit, etc., outside of knight-head	*30 ft. x 44 in.	†43 ft. x 30 in.
Spread of sail	15,653 yards	11,000 yards

* Jibboom, 18 ft. x 23 in.; flying jibboom, 14 ft. long.
† No jibboom.

The following table covers details of all passages made by sailing vessels via Cape Horn from any North Atlantic port, American or European, to San Francisco or any other California or North Pacific port, in less than 95 days. It will be seen that all were from New York to San Francisco. The record passage from a North Atlantic port other than New York was made by the extreme clipper *Romance of the Seas*, arriving here March 23, 1854, 96 days 13 hours from Boston:

The time made by the *Great Republic* from Sandy Hook, of 15 days 18 hours to the equator, and of 52 days to 50 degrees south in the Pacific, are the best on record. The runs of the *Flying Cloud*, 48 days (1851), and the *Swordfish*, 49 days (1851), from the equator in the Atlantic to a similar crossing in the Pacific, stand as best and second best and effectually disprove the claim that the *Andrew Jackson's* 53½ days (1860) ever was the record. Records for other portions of the Cape Horn voyage are: Equator to 50 degrees south in the Atlantic, *Samuel Russell*, 18 days; 50 to 50, *Young America*, 6 days; 50 degrees in the Pacific to the equator, *Live Yankee* and *Mary L. Sutton*, 16 days; equator to San Francisco, *White Squall*, 14 days. The *Russell* and the *Sutton* were sharp models; the others, clippers. It is not very wonderful that these vessels made great runs at times, but modern full-built ships could also show some speed under favorable conditions, as in the case of the *Florence*, Captain Kelley, arriving here August 4, 1878, 106 days from New York and reporting that on her ninety-first day out she was 671 miles from this port.

Name	Sailed from New York	Days to equator	Days equator to 50 degrees south	Total days to 50 degrees south	Days 50 degrees to 50 degrees in Pacific	Total days to 50 degrees in Pacific	Days 50 degrees south to equator	Total days to equator	Equator to San Francisco	Total passage
<i>Flying Cloud</i>	Jan. 21, 1854	17	25	42	12	54	20	74	15	89-1/3
<i>Flying Cloud</i>	June 3, 1851	23	24	47	7	54	17	71	19	89-7/8
<i>Andrew Jackson</i>	Dec. 25, 1859	20	23	43	10	53	20	73	17	90-1/2
<i>Swordfish</i>	Nov. 11, 1851	23	22	45	8	53	19	72	19	90-2/3
<i>Great Republic</i>	Dec. 6, 1856	16	26	42	10	52	21	73	19	91-5/6
<i>Flying Fish</i>	Nov. 1, 1852	21	27	48	7	55	19	74	18	92
<i>John Gilpin</i>	Oct. 29, 1852	24	23	47	11	58	20	78	16	94
<i>Sweepstakes</i>	Feb. 20, 1856	18	23	41	15	56	17	73	21	94

THE CLIPPER SHIP GREAT REPUBLIC

By F. C. MATTHEWS

THIS extreme clipper ship, the peer of all clippers, was to have been christened King of Clippers, but the great master-builder, Donald McKay, finally decided on using a grander name, one symbolical of the greatness of his adopted country, which was at that time the mistress of the seas. As the Great Republic she carried herself with all honor, but met her fate under a foreign flag and bearing a prosaic name, a worn-out, unseaworthy hulk. She was then the Denmark, of Liverpool.

She was launched at East Boston at noon on October 4, 1853, in the presence of a large and enthusiastic audience, said by authorities to have numbered over 70,000 people, many of whom had come from distant points.

One thrilling incident of the occasion was the near destruction of the little paddle-steamer Arago, which was passing by just as the ship was clearing the stocks and which had such a close call that her flagstaff was carried away. Aside from this near tragedy, the affair of the launching was a perfect success, and admiration was freely expressed as the noble hull rode majestically at her anchors.

She had been constructed by McKay for his own account, and it was reported that he had refused an offer of \$300,000 for her when fully completed. She was originally intended for the California trade, but because of a depression in that business and the low freight rates then prevailing, she in company with such clippers as the Kathay, Panama, Pride of America, Defiance, Tornado, and Comet was diverted to the trans-Atlantic run.

Her Destruction by Fire

The Great Republic was towed from Boston to New York and was loaded with grain and food supplies for Liverpool by Grinnell, Minturn & Company. When practically ready for sea on December 26, 1853, with most of her sails bent, sparks blown from a fire a black

That the clipper ship series creates considerable interest among readers of Pacific Marine Review is evidence by the following excerpt from a letter to our circulation manager renewing a subscription:

"Starboard your helm a little and luff. Clew up your weather tack and take observations from your mailing list, and am sure you will find that my subscription expires February 1, 1923. Have been on the manifest the last four years.

"The series of articles on the old clipper ships are sure to make a thoughtful old stiff like me sit up and pray God for some more of the old days when they had men and ships—not cabin dusters and cockleshells, like this generation.

"To have been aloft and aloft on nearly every old ship that entered 'Frisco' from the early '70s to the early '90s sure is my great delight—and read them with eager delight."

distant from her berth lodged in her foresail and, in spite of heroic effort on the part of crew and firemen to prevent the flames from spreading, her whole top-hamper was soon one mass of fire. The masts were then cut away and ultimately the firemen succeeded in getting control of the burning wreckage on deck, and when they left the scene it was believed that both hull and cargo were safe. Later, however, it was found that the blazing fore-topmast had in falling crashed end-on through three decks and ignited the cargo. This fire could not be controlled, and the ship had to be scuttled and was sunk alongside the dock, being burned down to the water's edge.

It was found that her grain cargo in swelling had seriously racked and strained the hull. The wreck was sold by the underwriters, who had written \$180,000 on the vessel. The cargo valued at \$300,000 was insured for \$275,000.

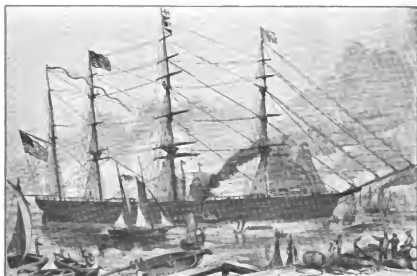
An incident of the loss which was made public at the time was a suit brought by the Union Mutual Insurance Company of New York against the Commercial Marine Insurance Company of Boston to recover \$10,000 on a policy which had been arranged by telegraph through Boston brokers on December 24 and perfected in the usual manner. Defendant company later disclaimed liability and refused to issue a policy, claiming the contract was incomplete, being made on Christmas day. Judgment, however was entered against them.

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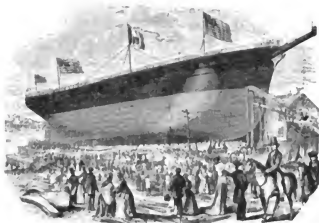
In this fire the well-known California clipper ship White Squall was very seriously damaged, and the packet ship Joseph Walker was destroyed.

Her Reconstruction

The wreck became the property of A. A. Low and Brother of New York and was floated and rebuilt at Greenpoint, Long Island, by Sneed and Whitlock under the superintendence of Captain N. B. Palmer. The work took upward of a year.



The Great Republic as she originally appeared; 4555 tons; spar deck; no mizzen skysail; the spanker topmast, 40 feet long, was divided at 15 feet and at 25 feet above the cap for gaff topsail and gaff topgallant sail.



Launch of the clipper ship Great Republic at Boston, Massachusetts, October 8, 1853. From an old print. "The most magnificent and most remarkable vessel, as well as the largest wooden ship, ever built. The occasion was made a holiday; schools were closed, business suspended, and an audience estimated at 70,000 people asher, on the wharves, in the shipping, and aboard steamboats, witnessed this stirring event."

The upper or spar deck which had been burned was not replaced, leaving her now with but three complete decks, and bulwarks took the place of the rail originally protecting the spar deck. The sheer remained the same, and while the general appearance of the hull was not greatly altered, yet all her spars were considerably reduced. Instead of swinging a 110-foot foreyard and a 120-foot mainyard, these spars were now 90 feet and 100 feet, respectively. The foremast, originally 130 feet long and mainmast 131 feet, were each 17 feet shorter, and all other spars were trimmed in proportion. From keelson to truck her mainmast was now 220 feet long. It has been stated that she had originally the Forbes rig, which called for elongated lower mast-heads with topmasts fidded abaft; but Captain Forbes, who was present at the launching and who kept in close touch with the great ship, denies this and says that her rig was that patented by Frederic Howes, and which was first used on the Boston clipper Climax in 1853. The Howes rig was an offshoot of that of Forbes.

One of our illustrations shows the ship under all plain sail and rigged to carry royal stunsails. This picture, of course, is her appearance after reconstruction and shows the original eagle's head replaced by a carved billet head and scrollwork.

Description—Capacity—Crew

Published descriptions of the Great Republic as originally built gave her dimensions as 335 feet, by 53 feet, by 38 feet; registered tonnage 4555. It was stated that her capacity was 6000 stowed tons. According to American Lloyd's Register of 1869, the figures were then 320 by 48½ by 29½ feet; 3356 tons. Her draft loaded was 24 feet.

On her first voyage to San Francisco she brought 5000 tons New York cargo, weight and measurement. In 1857 she took 4500 tons guano from the Chincha Islands to London. In 1860 she had from San Francisco to Cork 57,246 sacks of wheat and 2992 barrels of flour, said to be about 4100 tons weight. As a United States Army transport in 1862 she took from New York to New Orleans 500 troops, 500 horses, and 1000 tons coal, besides stores and equipment. On one occasion the clipper ship Thatcher Magoun, lying on the opposite side of Pacific Street wharf in the harbor of San Francisco, was described as being dwarfed to the size of a mere coasting schooner by the proportions of the Republic.

Her crew consisted of 50 A. B.'s, 15 ordinaries, and

some boys, besides the ship's officers, which included a surgeon; and in this connection it is noted that in 1865 this officer, Dr. O. L. Cook, was drowned by falling into San Francisco Bay from the railroad wharf at Oakland. The bulletin of April 14, 1860, said: "The Great Republic is not off yet. It takes a town, almost, to man her, and the lack of a township of able-bodied seamen has alone detained her for several days."

Becomes a Transport for the French Army

After her reconstruction the Great Republic loaded at New York and made the passage to London in 16 days; her time from Sandy Hook to Land's End was 13 days. She was then chartered by the French government for transport service in the Mediterranean at the rate of 17 shillings per ton per month. It was said that her owners refused a charter of \$100,000 for a service of nine months. In January, 1856, she was loading stores at Marseilles for the Crimea in company with the American ships Monarch of the Sea, Ocean Herald, White Falcon, Queen of Clippers, Astoria, and Titan. In this connection it is noted that France had no outsiders other than American vessels in this service, while Great Britain's list of chartered foreign transports showed none under our flag.

The Great Republic's performances challenged the admiration of our English and French friends, as well as the attention of the people of all the ports she visited. On one voyage from Marseilles to the Crimea with a heavy and valuable cargo and a large number of soldiers she was ordered to be taken in tow by a steamer; but a breeze springing up, Captain Limeburner loosed his topsails and topgallants and ran completely away from the steamer, putting her hull down in a few hours. A prominent Boston shipping merchant traveling in the Crimea at the time wrote: "Prouder than the 120-gun ship of the French, the Napoleon III; more dignified even than the Agamemnon of the English, the proud clipper of the Americans looks in her unassuming greatness the commander of the fleet."

Returns to Peaceful Pursuits

After several successful voyages in the Mediterranean, her services being no longer required, the Great Republic crossed over to New York and loaded for San Francisco. The following memorandum of the passage is from her log-book:

"Left New York dock December 5, 1856; dropped anchor in North River; weighed anchor 6th with aid of steam tug W. H. Webb, but in consequence of the



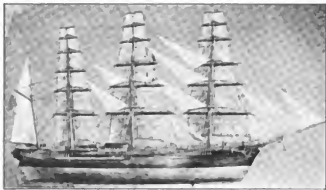
Great Republic under all plain sail as reconstructed; 3357 tons. A mizen kysail was added and the spanker-top-sail-gaff dispensed with.

low tides could not pass the bar at Sandy Hook; anchored at the quarantine; and discharged pilot December 7 outside of the lightship at 3 p. m. Position at noon, December 7, sea time, $39^{\circ} 18' N$, $69^{\circ} 01' W$; with fresh winds and a little snow, continuing the following day with snow and hail squalls." The fourth day out covered $1^{\circ} 25'$ of latitude and $7^{\circ} 6'$ of longitude; "with strong gales and heavy squalls; under skysails; wind a point free, giving 16 and 17 knots in the squalls." The following day made 413 knots, covering $3^{\circ} 58'$ of latitude and $5^{\circ} 16'$ of longitude; "strong gales and heavy squalls; made 360 knots in 19 hours, an average of 19 knots, and at the rate of 456 in twenty-four hours." December 13, one of the sailors, named William Stevens, died in convulsions very suddenly. He was a naturalized American seaman, formerly of Wales. December 16 carried away jibboom. December 21 at noon "are in 05° north latitude and will cross the equator with this breeze in 15 days 19 hours from Sandy Hook, the best on record." December 22, tacked to the east, then to the south. December 24, tacked four times. December 25, tacked to east northeast. At 7 a. m. passed Cape St. Roque, 19 days 14 hours from Sandy Hook, having had to beat for two days. January 4, "John Nicholson, seaman, of New York, fell from the upper foretopsail yard while securing the topgallant studding-sail boom and died in a few hours from the injuries. The distance he fell was 80 feet." January 17, was in $50^{\circ} 45'$ south, $63^{\circ} 46'$ west, 40 days out. January 19, 57° south, 64° west; "light airs under the lee of Staten Land, increasing to strong breezes as we got out in the open sea." January 21, passed longitude of Cape Horn in 45 days 7 hours from Sandy Hook and came around with skysails set. January 25, $55^{\circ} 24'$ south, $78^{\circ} 55'$ west; passed the latitude of Cape Horn at midnight, 49 days 9 hours from Sandy Hook. Crossed the equator on February 17 in 118° west, 21 days from 50° south, and 73 days out. Arrived off the Farallones March 8 in a thick fog; hove to for daylight; took pilot 11:30 a. m. Passage, 92 days. Was within 500 miles of the Heads for 5 days, being baffled with light airs, calms and fogs.

At the port of San Francisco the Great Republic was the center of interest and was inspected by thousands. To stand on her decks and survey her magnificent proportions was the only way to appreciate her immense size, as her model and lines were so perfect that she did not seem so large from a broadside or angular view. A lithographic view published at the time showed her being discharged at Greenwich dock with trams of horses doing the hoisting work, the clipper ship Hurricane being similarly employed at North Point dock.

This manner of handling cargo prevailed generally at that time, although the Placer Times noted on May 16, 1853, the commencement of a changing system as follows: "The old style of discharging ships by a bevy of hoisting, singing sailors has given way to the more expeditious method of horse power. Yesterday, however, we noticed a vessel at Broadway wharf discharging by steam power."

From this port the Republic proceeded to Callao in ballast; passage 54 days. Loaded guano at Chincha Islands for London. Put into the Falkland Islands September 8, 1857, 17 days out from Callao, in distress, having shipped a tremendous sea near the Cape which stove in the deck between the fore and main masts; had also lost sails and spars, and a schooner had to be sent from the Falklands to Montevideo for materials to complete repairs. She finally arrived out at London on January 11, 1858.



Model of the Great Republic on exhibition in the Musée de Marine at the Louvre, Paris. Note the fine hollow lines of the under-water body.

Continues in California Trade Until the Civil War

The Republic's following three voyages were: New York to San Francisco, 1858-59, 120 days; return to New York in ballast in 100 days. In 1859-60, same voyage: 110 days out; 98 days home, in ballast. In 1860-61, New York to San Francisco, 104 days; hence to Liverpool with grain, 96 days; Liverpool to New York, 32 days, in ballast.

Her outward trip in 1858 was prolonged by unfavorable winds in the North Atlantic, she having the long passage of 41 days to the equator. Left New York in company with the Adelaide, a fast sailer. They were in company for ten days and again for two days off Cape St. Roque. Adelaide arrived at San Francisco 13 days after the Republic.

On the following voyage she left New York, November 23, 1859; was 23 days to the equator; 51 days to the Horn; 18 days from 50° to 70° in strong north-west gales; crossed the line in 110° and was thence 19 days to the port of San Francisco. Took pilot 7 p. m., March 13, 1860. The extreme clipper Ocean Telegraph, arriving there the same day from New York, beat the Republic one day. The latter, however, reported a most delightful series of calms and light winds from the River Plate, for days together not making over four knots per hour. At San Francisco her cargo was mostly discharged into lighters in the stream and she took aboard 900 tons of stone ballast for the homeward run.

On the succeeding voyage she sailed from New York October 24, 1860; crossed the equator November 17; passed Cape Horn December 18; had a very heavy gale lasting from the 20th to the 23rd; was 11 days from 50° to 50° ; crossed the equator January 16, 1861; for the last few days of the passage had light north-northwesterly winds.

While in San Francisco harbor on this voyage and in tow of a tug, the Republic stuck on a reef off Rincon Point, which was subsequently known as Great Republic Rock. The tug got the big ship off, however, and filed claim for \$6000 salvage. The amount awarded was \$300 and costs.

The Republic as a Transport During the Civil War

On her arrival at New York on September 26, 1861, from Liverpool, the big ship was seized by the surveyor of the port on account of the majority of the shares being owned in the South; five-sixteenths were held by Virginia parties and the same amount by citizens of South Carolina. These interests were sold, the Messrs. Low, co-owners, taking them over. She was immediately chartered by the United States Government for transport purposes and made a voyage to Port Royal and return to New York. In February, 1862, she was fitted up for the Butler Expedition and

went to Ship's Island via Portland, Maine, returning to New York toward the end of June. About August 1 she went on the Great Balance Dock at the foot of Pike street, East River, to have her bottom overhauled and to be gotten into condition to resume her place in the California trade.

Back in the California Trade

Two additional round voyages to San Francisco complete the record of our world-famed ship under the American flag. In 1862-63 she was 102 days from New York; hence 43 days to Callao; loaded a cargo of guano at Chincha Islands; sailed from Callao August 24, 1863, but details of passage thence to London are not at hand. Loaded at London and sailed April 7, 1864; passed the Isle of Wight 13th and arrived at New York May 4.

In 1864-65 she was 114 days from New York, returning in 120 days.

On the first voyage of the present series the Republic left New York November 24, 1862; was 23 days to the equator; 50 days to 50° south; thence 12 days to 50° south in the Pacific; crossed the equator February 16, 1863, in 117° west; on March 1 was in 38° north, 134° west. Had it not been for unfavorable weather during the last week of the passage this would have proved a rapid one, well under 100 days.

On her last voyage to San Francisco she sailed from New York on October 24, 1864; was 27 days to the equator; thence 30 days to the Cape, off which was 9 days in strong westerly gales; had 29 days from the Horn to the Line; thence 19 days to San Francisco; the last 10 days of the passage had mostly light winds and calms.

On this voyage the Republic was in command of Captain Josiah Paul as successor to Captain Joseph Limeburner, who had had the ship from the commencement of her career. The crew were represented as insubordinate and inefficient, and there was trouble aboard all the passage. Warrants were issued on arrival for the arrest of Mate Walls and Second Mate Coe for cruelty to seamen, but they went into hiding. While in port one of the sailors was beaten to death in the Sacramento street deadfall of one Bagnello, and later the ship's surgeon was accidentally drowned in San Francisco Bay. Altogether the voyage was an unfortunate one.

On her last passage as an American ship she sailed from San Francisco June 24, 1865, and arrived at New York October 22. Reported having very light winds the entire passage, but particularly in the Pacific; was 28 days to the equator; 54 days to the Cape; crossed the Line in the Atlantic 85 days out and had the long run of 35 days thence to port; total 120 days. Was off the Horn 12 days in easterly winds.

Great Republic Goes Under Foreign Flag

Our big ship was laid up after her return to New York in 1865, and in 1867 was sold to parties in Yarmouth, Nova Scotia. Her managing owner was Captain Hatfield. In 1868 she ran from St. Johns to Liverpool in 14 days.

In 1869 she was purchased by the Merchants Trading Company of Liverpool and renamed Denmark. The

following from an article by Charles Nordhoff on "The Rights and Wrongs of Seamen," which appeared in Harper's Magazine of March, 1874, will be of interest:

"There was cited before an English investigating committee in 1873 a Mr. Fernie, the leading partner in a Liverpool company 'which owns ships and sails them,' and which it appeared had lost nineteen ships in ten years."

Included in the list of vessels lost was the Denmark, and the following facts were brought to light from the testimony:

"Mr. Fernie: 'She made water and was abandoned. No lives were lost. Her outward cargo of coals was insured.' Question by Mr. Cohen: 'Was she not well known to be a very rotten ship?' Witness: 'With all ships fifteen years old you would not find every timber sound in them. I have every assurance that the vessel was perfectly fitted for the work she undertook.' Captain Edgell, one of the commissioners, read a report he made on the vessel in 1870 showing that she was then in very bad condition. 'She was trussed with bars of iron screwed up amidships, like an old barn or church, before she started on this last voyage—that is to say, that the whole of the fastenings at the beam ends and knees were so rotten that there was no junction on the sides of the ship, and the only way of fastening the ship together was to introduce these enormous amounts of iron.' Mr. Fernie at first said she was surveyed by an American surveyor, whose name he did not know, but afterwards stated that the only surveyor was Captain Rudolf, one of his own partners. The Denmark was purchased for £3500, or about one pound a ton."

The Loss of the Famous Clipper

She had taken a cargo of coal to Rio and had sailed from that port on January 18, 1872, in ballast for St. Johns, New Brunswick, to load lumber for Great Britain. She had good weather until March 2 in 32° north latitude, when a fierce nor'wester set in and continued until next day. The ship began to leak alarmingly, the water gaining steadily on two double-action pumps. On March 5 the storm lulled, but the carpenters reported twelve feet of water in the hold and the captain ordered three boats to be provisioned and launched. The captain and eighteen sailors embarked in an iron lifeboat 40 feet long with airtight compartments; the first mate with ten men pushed off in the launch; and the second mate and seven men went in the cutter. The little fleet headed for Bermuda, but was scattered by the storm; all, however, arrived safely at Bermuda on March 6. The shipwrecked mariners were hospitably received, and the officers were highly praised for their noble and unselfish conduct.

Such was the end of the greatest wooden vessel ever constructed and the first American four-masted ship. She proved what her famous builder intended her to be, the fastest sailing vessel that man's skill has ever been able to produce. After her 92-day passage to San Francisco in 1857, Lieutenant Maury wrote: "She didn't have the luck to get a wind that could keep her to her mettle for twenty-four consecutive hours. . . The friends of this noble specimen of naval architecture can scarcely hope for a fair trial and proper display of her prowess until she shall be sent on a voyage to Australia. The brave westerly winds of the southerly hemisphere which she will then encounter will enable her to show herself; elsewhere she can scarcely find a sea wide enough with belts of winds broad enough for the full display of her qualities and capabilities."

KNOWING THE RULES OF THE ROAD

By R. F. FARWELL

Associate Professor, Maritime Commerce, University of Washington.

Professor Farwell in this article, written expressly for *Pacific Marine Review*, calls attention to the need of better training in the knowledge and interpretation of local, national, and international rules of the road at sea and to the advisability of more frequent tests applied to the deck officers of our merchant marine.



INTERNATIONAL rules for the prevention of collisions at sea have been in effect since 1889, and inland rules, with slight changes, since 1897; but we continue to have collisions with more or less frequency. They occur not only in thick fog, but in broad daylight, with the sun shining, and on clear nights, with all lights burning brightly. An examination of the records of several thousand cases of collision that have come before the Federal courts since the present rules were adopted discloses the surprising fact that less than three per cent of

these collisions were due to what the courts call inevitable accident, and that the other ninety-seven per cent were due to faulty navigation: that is, one or both vessels violated some rule of the road designed to prevent collision under the particular circumstances of the case. We cannot legislate away all the errors in navigation any more than we can legislate away all the other frailties of human conduct. There will always be accidents due to mistakes in judgment. But there is one prolific cause of collisions which can and should be eliminated, and that is ignorance of the rules of the road.

Clear Knowledge Necessary

By ignorance of the rules, I do not mean total ignorance, but rather a lack of a clear understanding of them. To really know the rules of the road entails more than the memorizing of a number of facts: you must be able to analyze any situation you find yourself in at sea, and take action on the rules that apply. The average quartermaster knows the compass card. He can name all the points forward or backward, and can head the ship on any given course. But suppose you give him a blank piece of paper and tell him to draw from memory the compass card he has looked at for four hours every day. Only a very exceptional seaman could properly space and reproduce the marking of his points, half points, and quarter points, and make the design at north. This is a homely illustration of the difference between knowledge that is hazy and knowledge that is clear.

We get along in the world very well with a hazy knowledge of most things, but in order to be successful we must have a highly specialized knowledge of a few things; and to the navigator surely there is nothing more vital than the rules of the game he plays, a proper understanding of which may involve the lives and property in his charge many times every day. If you are acquainted with the rules of the road to the extent of knowing the usual passing signals in inland waters, the lights you are supposed to carry, and fifty per cent of the sound signals for fog, your knowledge of the subject is probably as good as the average master mariner's, though somewhat hazy. If, on the other hand, you can visualize any given nautical

situation, call to mind all the rules that govern, and properly apply them—then you are one of those exceptional navigators whose knowledge of the rules is clear.

Some Examples

A few years ago a collision occurred in a thick fog off the California coast between the *Selja*, a Norwegian tramp, and the coastwise steamship *Beaver*, in which both vessels were seriously damaged. The *Selja* was making half speed, about six knots, when she first heard the fog signal of the *Beaver*, and five minutes later her speed was cut down to three knots. The vessels continued to approach each other for five minutes more, and the *Selja*'s engines were then stopped. She drifted for another five minutes, and then, on sighting the *Beaver* ahead, her engines were put at full speed astern for one minute, when the collision came. The *Selja* was practically dead in the water when struck, while the evidence showed that the *Beaver* was maintaining excessive speed. It would seem that here was a case of extreme negligence on the one hand and of extreme caution on the other; but the Supreme Court held both vessels equally liable, the *Beaver* for excessive speed and the *Selja* for failure to stop her engines on first hearing the signal of the *Beaver*. Evidently the master of the *Selja*, who was obviously trying to be careful, did not have clearly in mind that part of Article 16 which says: "A steam vessel hearing, apparently forward of the beam, the fog signal of a vessel the position of which is not ascertained, shall, so far as the circumstances of the case admit, stop her engines, and then navigate with caution until danger of collision is over."

The writer was recently bound up the coast in a destroyer which was making seventeen knots in a thick fog when the whistle of a steamer was heard two or three points on the bow. The commanding officer stopped her engines in obedience to Article 16 and immediately began to blow the two-blast signal, although the ship was forging ahead with the momentum given by a seventeen-knot speed. Apparently he was actuated by a hazy knowledge of Article 15-b, which provides the signal of two prolonged blasts in a fog for a "steam vessel under way, but stopped, and having no way upon her." Had the other vessel, maneuvering on the assumption given by the signal that we were standing still, collided with us, it is obvious that the fault and the liability would have been ours.

In a recent collision now pending in the courts between two vessels crossing in inland waters, the master of the vessel having the right of way sounded one blast, as provided in Pilot Rule 7, and held his course and speed as provided in Article 21 until collision was imminent, when he tried to avoid collision in accordance with Article 27 by reversing his engines. He followed every rule applying to the case but one; but the fact that he failed to sound the four-blast warning when in doubt as to the other vessel's intention as provided in both the inland and pilot rules, whether or not it contributed to the collision, has cost him his license for a considerable period of time. The mis-

takes were made in all these cases by masters with excellent records and years of experience, and are therefore typical illustrations of the point I am trying to bring out: namely, that many of our ablest and most trusted navigators are lacking in the comprehensive grasp of the rules which is necessary to safe navigation.

A Test for Officers

If you are a licensed officer and feel satisfied that your daily experience is sufficient to keep the rules fresh in your mind, and to prepare you to act properly in any situation that may arise, it is suggested that you try yourself on the following questions:

1. Under what circumstances is a vessel required to hold her course and speed?
2. Under what rules would you operate in making a voyage from San Francisco to Seattle?
3. You are on a steamer at sea in a fog and your engines break down. What fog signal will you use?
4. Under what circumstances does a tug carry three white lights in a vertical line?
5. What rule makes it necessary to have a lookout?
6. When would you blow three short blasts in a fog?
7. When must you keep a lookout astern?
8. You are on a steamer being towed from one dock to another in inland waters at night. What lights will you carry?
9. At sea you meet another steamer in the crossing situation and you have the right of way. What sound signal can you give?
10. What is the difference between a signal of two blasts under international rules and the same signal under inland rules?

If you can answer the above questions offhand, you are probably one of the few navigators who have a clear knowledge of the rules of the road. The correct answers follow:

1. (a) A steamer in the crossing situation having the right of way over the other steamer; (b) any vessel overtaken by another vessel; (c) a sailing vessel meeting a steamer; (d) a sailing vessel closehauled meeting a sailing vessel running free; (e) a sailing vessel closehauled on the starboard tack meeting a sailing vessel closehauled on the port tack; (f) a sailing vessel running free with the wind on the starboard side meeting a sailing vessel running free with the wind on the port side; (g) the leeward vessel when two sailing vessels running free with the wind on the same side approach each other; (h) a sailing vessel with the wind anywhere but aft meeting a sailing vessel with the wind aft.
2. From San Francisco to sea under inland and pilot rules; thence to the limits of inland waters on the Strait of Juan de Fuca under international rules; thence to Seattle under inland and pilot rules.
3. One long and two short blasts of the whistle at intervals not exceeding two minutes.
4. When she is towing more than one vessel and the length of the tow from the stern of the tug to the stern of the last vessel in the tow exceeds 600 feet.
5. Article 28: Nothing in these rules shall exonerate any vessel, or the owner or master or crew thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper lookout, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.
6. When another vessel is in sight and your engines are going full speed astern.
7. (a) When leaving anchorage or moorings; (b) when going astern; (c) at night when no fixed stern light is carried; (d) at all times when changing course.
8. All running lights.
9. A detonating signal.

10. (a) Under international rules signifies change of course to port; (b) under inland rules signifies a starboard to starboard passing, whether or not a change of course is required.

Memory Test Inadequate

It is a fact that most licensed officers honestly believe themselves thoroughly posted on the rules of the road. They have passed the inspectors' examinations and therefore have documentary evidence of their proficiency. What more could be required? There are at least two good reasons why the average master mariner has only a passing acquaintance with the rules. In the first place, that is all that is required to obtain a license. The inspectors' examination on the rules is usually nothing more than a memory test of lights and sound signals rather than a test of the candidate's ability to apply the rules in difficult situations. This is pretty generally known, and consequently the candidate devotes most of his preparation to the mysteries of the time sight and the meridian altitude. The rules of the road are crammed into the last day or two before the examination and the various sound signals and the regular and special lights are memorized parrot fashion. Naturally, facts learned in this way do not stay long in the memory. How many of the special lights could you name two weeks after you got your last license? You are in no way to blame, for if you got the license you have prima facie evidence that you did all that was required of you. When you have run the gauntlet of all the mates' examinations and successfully passed for master, you are through with studying so far as the inspectors are concerned; and it is usually true that the longer a master has his license the less he can tell you about the rules of the road. This is not an attempt to be facetious, but an honestly expressed opinion based upon considerable experience in instructing classes of masters and mates.

The second reason why officers are not more familiar with the rules is that the importance of knowing them thoroughly has never been brought home to them. Unless you have actually been in a collision that resulted in a law suit for your owners, you probably have not realized what a departure from the rules might cost in dollars and cents. Most seafaring men will scout the idea of attempting to become familiar with the interpretations put on the rules of the road by the Federal courts; yet it is just those interpretations, as expressed in decisions of other collision cases, that nine times out of ten determine whether or not your vessel is liable for the collision. The important point is not what you think a rule means, but what the Supreme Court says that it means. There is hardly a rule that has not been clearly interpreted and explained by the courts, and unless you are familiar with the ruling decisions, all the information you can get merely by reading the rules themselves will be of little value.

Liability

If you have a collision and the case is brought into court, there are four possibilities as to the decision: (1) both vessels may be at fault, in which case the damages will be shared equally; (2) your vessel may be solely at fault and sustain all the damages; (3) the other vessel may be solely at fault and sustain all the damages; (4) both vessels may be free from fault, and the collision held due to inevitable accident. The importance of knowing exactly what is required by the rules lies in the fact that the violation of any rule, however slight, is held by the courts to be a presumption of fault unless it is proved that the violation

could not have caused or in any way contributed to the collision. When a collision follows this is almost impossible to do, and unless you have acted entirely in accordance with the rules as interpreted by the courts, your owner pays at least half the damages. Though the other vessel be culpably negligent, a seemingly trivial error on your part may put fifty per cent of the costs on your vessel.

It is a simple matter for every licensed officer to know the rules of the road clearly and thoroughly. Various books have been published in the United States and in England which set forth the rules as interpreted by the admiralty courts of both countries. One such book should be a part of every navigator's library just as much as an epitome of navigation is now. Pamphlets containing the international, inland and pilot rules are given by the inspectors to every officer at the time he receives his license. It should be borne in mind that it is important to read the rules at frequent intervals in order to keep posted. General principles can be permanently memorized, but it is not safe to trust the memory for all the details. Admiral Knight recommended that young officers always read the rules of the road through before getting under way. This may not be practical in the merchant service, but it certainly is an excellent precept. It should be a matter of professional pride to the navigator to know the rules as well as he knows the day's work.

Suggestions for Improved Tests

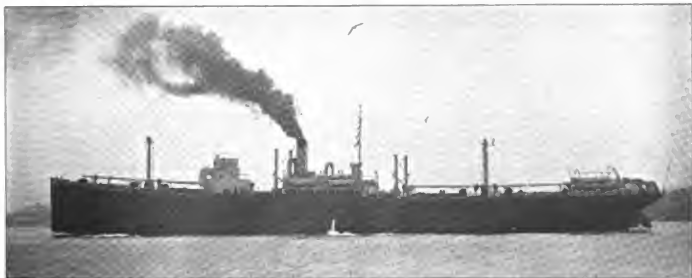
There are various ways in which this very desirable result might be brought about. In the first place, the inspectors' examinations should be made as rigid as possible. They should be more than the memory tests that with few exceptions they now are. They should be of such a character as to test a man's ability to analyze a situation quickly and to apply the rules in the way the courts expect them to be applied. "Given a set of conditions and a situation, what would you do?" should be the type of question asked. Moreover, every officer should be examined on the rules at frequent intervals, regardless of the license he holds. We require an annual inspection of the vessel to determine her seaworthiness. Why not at the same time require her officers to satisfy the inspectors that they know the rights and duties of their own vessel with respect to other vessels, those who fail having their license suspended until their deficiency is made up? A navigator frequently loses his license for ignorance

of the rules; this arrangement would cause it to be taken from him before a collision instead of afterwards. Such a system would work no hardship on the conscientious officer who keeps posted as he should; it would weed out some of those who persist in deriving their knowledge of the rules of the road by the collision method.

Until the inspectors devise some such scheme of keeping check on the officers, any improvement along the lines suggested must come from the operating companies and the officers themselves. The operators should satisfy themselves as to the qualifications of the masters in this regard, and the masters in turn check up on the mates of their respective vessels. The company's legal adviser should notify navigating officers of any important legal decision involving the rules so that they may keep up to date in their information. Every master should not only keep very well posted himself, but should feel free to question his mates on the rules at any time, and when necessary instruct them. Great benefit might be derived from frequent discussions among the officers of a ship; in fact, mess room arguments furnish excellent schooling, provided the question is not left hanging in the air, but is finally settled by proper authority.

Educational Campaign Needed

It is time that we have a campaign of education in this very vital, but generally neglected, phase of ship operation. If you are an operator, see to it that the importance of knowing the rules of the road better is called to the attention of every officer in your fleet, and that he is supplied with the necessary material for acquiring that better knowledge. If you are a master, start the ball rolling on your own ship; first, by improving your own knowledge, and then by encouraging your officers to go and do likewise. If you are a licensed officer, make up your mind to have a clear knowledge of the rules of the road as part of your professional equipment; and begin to carry out your resolution by studying the rules regularly. Find out just what they mean, as interpreted by the highest authority in the land, and impress them so firmly in your own mind that the next time you get into a close place your action will be automatically what it should be. You will find the rules a most interesting study, and the confidence that comes from knowing just how to take care of your ship in all circumstances will more than repay the effort. And what is more important, we shall have fewer collisions.





AMERICAN SHIPBUILDING

FREQUENTLY during the excitement of the war emergency shipbuilding program, Pacific Marine Review has pointed out editorially the folly of building so many standard ships of one type. This view has been emphasized recently by the statement of Chairman Lasker that more than one-third of the steel ships owned by the Shipping Board are useless for ordinary commerce and that another third are suited thereto only very moderately. This statement by the chairman of the Shipping Board aroused a storm of protest, and it was at first very much misunderstood.

For a number of years before the war freight service by sea developed a decided trend toward specialism, it being found that certain types of steamer or motorship were especially adapted to certain routes and trades, and today under the stress of competitive freight rates the shipping world is coming back to the lessons which it learned before the war and is finding that only by the judicious use of the best type of cargo carrier for the work in hand can even the minimum of profit, which is the present rule, be maintained.

The British shipbuilders and shipowners are loudly calling for the "scrapping" of much of the present tonnage of the world, and many of the old, established shipbuilders are in receipt of inquiries from prospective purchasers for especially designed ships.

Many of the ships of the Shipping Board in the United States and many of the standard ships abroad could undoubtedly in normal times be profitably converted to special types, and undoubtedly many of them will be so converted, provided that they come through the slack time in shipping in sufficiently good condition to make such conversion profitable.

With this knowledge of the real need for special types of ships the American shipbuilder should be alive

to the opportunities now before them for research work in naval architecture and marine engineering so that they may be prepared to put before the prospective American customer the most economical ship for his needs. He may be sure that his European cousins are doing this very thing, many of them spending huge sums to keep their organizations abreast or ahead of the best practice in the world's shipbuilding yards.

It would seem to the editor that the shipyards of America might at this time profitably get together for the purpose of supporting research work in marine engineering and shipbuilding methods, the results of which would be open to all the yards. There are so many questions in connection with the development of the Diesel engine for marine purposes in connection with the use of welding to replace riveting in ship construction; the savings to be effected in the handling of materials aboard ship by the use of electricity instead of steam; so many methods and materials yet open to improvement, that a competent corps of experimental workers should be able to produce very tangible results for the good of the American merchant marine and the American shipbuilder at a cost which, if divided among the various yards, would be practically negligible when compared with the results.

THE NAVAL ARCHITECTS AND MARINE ENGINEERS

THE twenty-ninth general meeting of the Society of Naval Architects and Marine Engineers was held in New York, November 17 and 18, and produced a very well balanced program of thirteen addresses. Two of these were strictly naval, one by Rear-Admiral Rogers on "The Technical Relations Between Different Classes of Men of War in Relation to Design"; the other by Mason S. Chace on "The Development of the Three-Plane Navy With or Without Battleships."

Three of the papers were directed chiefly to the factor of operation. "American Classification of American Vessels," by W. A. Dobson, makes a very eloquent plea for the American Bureau of Shipping. "How Can American Ships Compete Successfully with Foreign Ships?" by Winthrop L. Marvin, which is printed in full as the leading article in this issue of Pacific Marine Review, gives a masterly analysis of the operating problem facing American ships in competition with the ships of European and Japanese nationals. "The Improving of Port Facilities in the Development of a Merchant Marine," by Rear-Admiral H. H. Rousseau, treats of the material handling problem at our ports in its relation to ship operation.

Those papers devoted exclusively to marine engineering features are two in number and both deal with the use of electric power on board ship—one by W. E. Thau on "Electric Propulsion of Ships"; the other, "Electric Auxiliaries on Ships," by Edward D. Dickinson.

The shipbuilders will find interest in "Cost Accounting and Estimating," by H. H. Schulze, and "American Shipyard Apprenticeships," by Charles F. Bailey.

Naval architects will delight in "The Technical Calculations of the Transverse Strength of Submarines," by Professor William Hogvaard, and "The Influence of Shape of Transverse Sections Upon Resistance," by Professor Herbert C. Sadler and E. M. Ragg.

Of general interest to operator, marine engineer, naval architect, and shipbuilder alike, is the paper on "Power and Speed Trials of a 10,000 Deadweight Ton Tanker," by H. H. Everett, and that on "The Design and Construction of Passenger Steamers," by E. H. Rigg.

NEW MOTORSHIPS

ON page 718 of this issue of Pacific Marine Review will be found a general description of the motorships Californian and Missourian now being completed at the Merchant Shipbuilding Corporation for the American-Hawaiian Steamship Company. These motorships are notable as being the first privately built and owned American motorships in the 10,000-ton class.

The American-Hawaiian is certainly to be congratulated upon its progressive policy in building these two fine vessels at a time when building costs are so high and freights so low. For that matter, the American-Hawaiian has always been a progressive pioneer among the American merchant marine companies. They started the first real coast to coast freight service by water. They were the first, or among the very first, to use oil fuel on their ships; and now these two first-class 11,500 deadweight ton motorships give them the premier rank among American motorship operating companies.

A comparison of the dimensions of these motorships with those of the original California is given in the article above referred to, and the attention of operators is directed to the tremendously increased cruising radius of the motorship with practically the same amount of fuel in proportion to the total cargo capacity.

Operators should also carefully follow the performance of the William Penn, the big Shipping Board motorship, which recently completed a trip from New York to Yokohama carrying 11,000 tons of cargo. No attempt had been made on this ship to show any particular record for economy. She consumed on her voyage an average of 13 tons of fuel oil a day at sea for an average speed of 11 knots. We note from a clipping in a Japanese newspaper that the Japanese are marveling at her low consumption of fuel in port. Working her winches and lights, "she consumes the ridiculously low amount of two barrels of oil a day. She took on oil at Honolulu and has enough in her bunkers to carry her around the world. She has a crew of 42 men as a motorship and would require 56 men as a steamer, and in the latter case would burn in the neighborhood of 40 tons of fuel oil per day. Her operation on her maiden voyage has been 100 per cent perfect."

THE LEVIATHAN

AT the time of her war use the Leviathan was the largest ship in the world, and with the exception of the White Star steamer Majestic, which is not yet in use and will not be until sometime in April, 1922, the Leviathan is still the largest ship afloat.

All Americans who are interested in America's merchant marine will feel a thrill of natural and pardonable pride in the fact that this greatest of modern steamers is under the American flag. They will also feel a sense of shame that this steamer has for so long a time been tied up to a wharf on the New York waterfront.

The history of her sale to the International Mercantile Marine Company and of the stopping of that sale by an injunction suit is well known to all of those who read the daily press. Not so well known, however, to the American public is the fact that, notwithstanding what would seem to have been very harsh treatment of the International Mercantile Marine at the hands of America's politicians, that company, which is a strictly American company—rumors

and propaganda to the contrary notwithstanding—have practically at their own expense supervised the care of this ship so that she is now in just as good condition as she was at the close of the war.

We are reliably informed from authoritative sources in New York that the Leviathan, as far as the hull of the ship is concerned and the upkeep of the engines and her machinery, is in first-class condition. After the fire of August 24 the International Mercantile Marine Company installed aboard a Newman's safety clock system, which checks the watchmen in such a way that no spot on the vessel can remain uninspected for over one hour. The International Mercantile Marine Company also executed a contract with a New York company who were to clear the vessel of rodents at a certain rate per rat. At the last report this contract was working out on the basis of the five men catching two rats a day. When it is considered that the Leviathan, fully equipped, is practically a floating town of 4000 inhabitants, it will be seen that in comparison with any similar structure, afloat or ashore, she is practically free of rats.

In addition, the company's experts and draftsmen have prepared plans and specifications for the reconditioning work on this ship to equip her as a first-class passenger liner for the North Atlantic trade. This work, which involves a tremendous amount of detail, had been going on for over eight months, and at the time of the recent renewal of interest by the Shipping Board Emergency Fleet Corporation in the reconditioning of this vessel this work was finished and became immediately available for Shipping Board purposes.

The man personally responsible for the production of these plans and specifications was W. F. Gibbs of the International Mercantile Marine Company, who for eight months devoted practically all of his evenings and Sundays to supervising the work of the draftsmen and preparing therefrom the specifications. It is sincerely to be hoped that when the government calls for bids on the reconditioning of this vessel the International Mercantile Marine Company will be given ample opportunity to use the results of the work of Mr. Gibbs, and that the experts of this company will be permitted to supervise the actual reconditioning of the vessel. These experts are more familiar with this class of work than anyone in America and possibly than anyone in the world.

It is roughly figured that the reconditioning will cost in the neighborhood of \$10,000,000. The American Legion class of Shipping Board passenger and freight liners—517 feet between perpendiculars; 14,300 gross registered tonnage—cost between \$7,000,000 and \$8,000,000. The Leviathan measures 907 feet 6 inches between perpendiculars and has a gross registered tonnage of 54,282. If we consider her value to the Shipping Board in her present condition as \$4,000,000, which was the highest price offered for her at the time of the attempted sale, we must certainly figure that \$10,000,000 added to that price will still hold her book value well within conservative limits as compared with the book value of the American Legion class. On a tonnage basis, if the American Legion is worth \$7,000,000, the Leviathan would be worth \$28,000,000. In speed, in elegance of accommodations, and in everything that goes to make up a first-class passenger vessel, the Leviathan is the last word in the pre-war race for supremacy in the crack passenger fleets on the North Atlantic. Nuff sed.

AMERICAN MARINE WEEK

FOR six days, November 14 to 19, inclusive, New York, acting as host to the shipping and shipbuilding industries of America, featured the annual meeting of the American Society of Naval Architects and Marine Engineers, the annual meeting of the American Society of Marine Draftsmen, and the annual Marine Show under the auspices of the Marine Equipment Association of America.

This show was an unqualified success financially, and as an exposition of marine machinery, marine fittings, equipment, shipbuilding facilities, etc., was stated by experts to be the best thing of its kind ever put over in America.

During the show the Marine Equipment Association of America held its annual meeting, at which Colonel Edward A. Simmons was re-elected president, W. M. Wampler of the Elcon Company was elected vice-president, and the nominating committee recommended to the executive committee that H. C. Davis of Row and Davis be re-appointed treasurer, and that Robert B. Lea of the Sperry Gyroscope Co. be appointed secretary to succeed K. L. Ames, Jr., resigned. The following members were elected to the executive committee succeeding those whose terms expire at the end of this year: First district (New England States), Albert C. Ashton, Ashton Valve Company, Boston, Mass., and E. S. Anderson, Scovill Manufacturing Company, Waterbury, Conn.; second district (New York and New Jersey), Gardner Cornett, Pneumercator Company, New

York City; third district (Pennsylvania, Maryland, Delaware, District of Columbia, Virginia and West Virginia), W. P. Smith, William Cramp & Sons Ship & Engine Building Company; fifth district (states contiguous to the Great Lakes and the Middle West), Benjamin Neilds, Jr., National Malleable Castings Company (Cleveland), New York City; and sixth district (Pacific Coast), K. W. Heinrich, Bethlehem Shipbuilding Corporation, Ltd. (California yards), South Bethlehem, Pa.

At this meeting a resolution was adopted requesting the executive committee to consider changing the name of the association to Marine Association of America, which name the meeting felt would cover in a broader way the activities of the association. Undoubtedly this change will be made.

Much of the credit for the success of this show is due to Colonel E. A. Simmons, who not only devoted much of his own time to the preparatory work but also put at the disposal of the association a number of members of the staff of Marine Engineering and Shipbuilding Age.

It was felt by all of the exhibitors that an annual show of this kind, properly managed under the guidance of such an association, was of vastly greater benefit than a number of smaller shows staged under the management of individuals or societies not under the control of the marine industries.

A full report and many pictures of exhibits will be found elsewhere in this issue.

IN RECOGNITION OF ACHIEVEMENT

Among the shipbuilding fraternity, of the Pacific Coast at least, Charles M. Schwab is looked upon as the greatest personal force that was behind the achievement of our records in shipbuilding during the war emergency period. Crystallization of this feeling was expressed in a banquet given to Mr. Schwab by Pacific Coast shipbuilders at the Waldorf-Astoria, New York, on Thursday, November 10.

At this dinner there was presented to Mr. Schwab "An Allegory of Achievement," a bronze shaft which had been designed especially for this occasion by Mr. Haig Patigian, a sculptor of note and president of the Bohemian Club of San Francisco. As described by Mr. Patigian, this bronze is a "shaft two feet in height and ten inches in diameter. At the top of the cylindrical composition is portrayed the idea of 'Ships that sail to the four corners of the Globe.' The conventional prows bear figureheads of Pegasus, symbolic of success and achievement. The principal circular body of the bronze is divided into four panels by four flat columns. Each panel contains a figure, typifying respectively Patriotism, Progress, Industry and Commerce."



"Patriotism is a male figure with a helmet, standing ready to defend the emblems of his country. Behind him the American eagle spreads its wings in protection.

Progress is depicted by a female figure, with the torch of civilization resting against her shoulder.

Industry, a powerful male figure, leans on a hammer and stands against a background of mechanical devices.

Commerce is a female figure whose right hand rests on a conventional rudder, while in the left she holds a caduceus, which was the wand of Mercury, god of commerce."

The committee representing the Pacific Coast shipbuilders in the arrangement of this banquet and the presentation of the bronze shaft was composed of Walter Johnson, president Union Construction Company, Oakland, California; Dan Hunlon, president Hanlon Shipbuilding and Dry Dock Company, Oakland, California; R. S. Moore, President Moore Shipbuilding Company, Oakland, California; Joseph J. Tynan, general manager Union Plant of the Bethlehem Shipbuilding Corporation, Ltd., San Francisco, California.

A GREAT AMERICAN LEGAL NAVIGATOR

EUGENE TYLER CHAMBERLAIN was appointed Commissioner of Navigation in December, 1893, by President Cleveland and for nearly twenty-eight years accordingly has had a share in the administration of laws relative to ships and shipping and also in legislation upon those subjects. Soon after entering office he took up the work of carrying into effect the recommendations of the International Maritime Conference held in Washington in 1889. As secretary of the American delegates to that conference he was instrumental in bringing about the adoption by Congress of the revised international regulations for preventing collisions at sea, proclaimed by the President in December, 1896, and the "rules of the road" for inland waters of the United States and for the Great Lakes.

In 1895 he secured the passage of the ship measurement act, which with later modifications brought the tonnage measurement of American ships, especially steamers, into accord with the system employed by Great Britain and other maritime powers. The same year through the active efforts of the late Senator William P. Frye of Maine a bill drafted by Mr. Chamberlain was enacted repealing nearly all of the obsolete navigation laws which embarrassed to a greater or less extent American shipping. He drafted the law of 1898 which applied more rigidly the coastwise principle to trade by sea with Alaska to meet the rapid development of that territory following the discovery of gold, and also the laws of 1900 applying to Hawaii and Porto Rico that principle of reserving to American ships the trade between American ports. He has always opposed, however, the application of that principle to trade with the Philippines on the ground that it would be detrimental to the progress of the archipelago and might create a grievance there similar to one of those which led to the American Revolution and furthermore would be a perversion of the coasting trade principle as recognized in international law.

The extensions of free shipbuilding materials in the Payne and Underwood tariffs were recommended by the Commissioner of Navigation as well as the reduction of tonnage taxes in the tariff of 1909. The revision in 1908 of the Act of 1882 relative to accommodations for steeage passengers was drawn by Mr. Chamberlain as well as the motor boat act of 1910, providing the safety equipment of this increasing and popular type of water transportation.

The Act of 1910 requiring wireless apparatus and operators on ships carrying fifty or more passengers was drawn by and passed on Mr. Chamberlain's recommendation and has since been adopted by other maritime nations. In 1912 this act was extended so as to require continuous wireless watch on shipboard, and this principle was incorporated in the International

In August of this year Eugene Tyler Chamberlain resigned the office of Commissioner of Navigation to enter the Bureau of Foreign and Domestic Commerce. For twenty-eight years Commissioner Chamberlain has been a conservative, constructive force in the administration and initiation of laws relative to ships and shipping. Very consistently he has opposed many of the measures passed by Congress, which have since been proved handicaps against American competition in foreign trade, and some of the most constructive measures were personally drawn up and recommended by him.

The Department of Commerce is to be congratulated on the fact that the rich experience and mature judgment of this able official is still available for their use.

Convention of 1914 on Safety of Life at Sea. In short, as Commissioner of Navigation, Mr. Chamberlain has been consulted on nearly all American maritime legislation for a quarter of a century, except that involving the United States Shipping Board. He opposed for years several features of the LaFollette Seamen's Bill, especially the provision requiring a large percentage of able seamen of three years' deck experience on American cargo boats, on the ground that it would be a heavy handicap on American ships and would tend to increase alien deck crews on American ships and keep young Americans from a seafaring life.

Mr. Chamberlain has been for some years an honorary associate member of the Society of Naval Architects and Marine Engineers, and a member of the Maritime Law Association. He was secretary of the Pan-American Customs Congress, comprising delegates from the United States and the republics of South and Central America and Mexico, which met in New York in 1903 to promote uniformity of navigation laws among the American republics. He helped in the American preparations for the International Conference on Safety of Life at Sea at London in 1913-14, following the Titanic disaster and was one of the American delegates to that conference. In 1902, by designation of President Roosevelt, he acted temporarily as auditor for the Navy Department in addition to his regular duties.

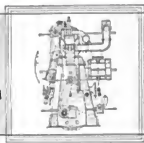
At the outbreak of the world war in 1914 Mr. Chamberlain drew up and recommended the Ship Registry Bill which was passed August 18, 1914, and resulted in the prompt transfer from foreign flags to American register of upwards of 500,000 gross tons of shipping, which, without costing the government a penny, gave the initial impetus to recent American maritime development and added greatly to our ability to transport at once our troops and supplies overseas when the United States entered the war in 1917. He then served as a member of the Shipping Committee of the Council of National Defense.

Generally Mr. Chamberlain has been for years an advocate of "free ships" for foreign trade (adopted in the Ship Registry Act of 1914) and of subsidies on the ground that these policies are not alternative or conflicting, but independent methods of dealing with two phases of the subject and are both employed by the other principal maritime nations of the world. He has opposed discriminating import duties on the ground that they are contrary to traditional and approved American doctrine, that they are specially disadvantageous to a nation like the United States, the volume of whose exports so greatly exceeds its imports, and that when employed over a century ago they were provocative of retaliation and counter-retaliation, commercial irritation and ultimately war.

(Continued on page 732)



Oil Engines and Motorships



THE MOTORSHIPS CALIFORNIAN AND MISSOURIAN

The American-Hawaiian Steamship Company has always been a pioneer. First in coastwise purely freight service, beginning in 1900 with the original steamer California, which was lost in war service, they were the pioneers in the use of oil fuel under boilers, beginning the change in this system in 1904. Now they are the pioneer American company in the use of big motorships.

THE twin screw motorship Californian was launched at the yard of the Merchant Shipbuilding Corporation, Chester, Pennsylvania, November 14, 1921.

The Missourian, sister ship to the Californian, will be launched within a month thereafter.

The launching of these motorships marks the advent of the Merchant Shipbuilding Corporation into the field of large full-powered Diesel engine freighters, and the placing of this corporation in the foremost rank of progressive shipbuilders of ships of modern type.

The only American-built ship comparable with the Californian and Missourian is the William Penn, whose engines were built in Denmark and installed in a hull originally intended for geared turbines.

For long voyages, the motorship will soon be regarded as the desired type. This seems to be the generally accepted opinion, judging from the numerous inquiries received in reference to the Californian and Missourian upon the efficiency and economical points in question.

Evidently prospective ship-buyers are studying the problem with keen interest. Recent British ship construction reports show that there have been less motorship cancellations than there were steam propelled ships. German shipbuilders have very actively taken up the construction of Diesel driven motorships. American ship-owners are beginning to appreciate the situation and desirability of developing the construction of ship types similar to the Californian and Missourian.

The initial cost of equipping these new types of motorships with internal combustion engines did not de-

ter the directors of the American-Hawaiian Steamship Company, whose ships are operated by the United American Lines, from appropriating the additional investment, because they were assured by the officers and technical staffs of the owners and builders that the efficiency and economy effected would finally justify the expenditure.

It is believed by advocates of the motorship that it would be a progressive step in the upbuilding of the American merchant marine to convert at least 50 per cent of our existing freighters and passenger freighters, which are tied up, to Diesel or Diesel electric power.

Best Type

The Californian and Missourian are considered the most acceptable type of motorship for the establishment and maintenance of long distance voyages for both cargo and passenger carrying trade or for combined cargo-passenger routes. Both are equipped with the most modern, efficient, and economical machinery and commercial appliances known today.

The size and tonnage of these motorships are the outstanding features for economical service. The lines of the Californian and Missourian especially distinguish them for their elegance and practicability, while the quality of workmanship is superior in every detail—the sample product of a new type of cargo vessel in an old shipyard which has been building ships for more than sixty-two years, and which continues to hand down the enviable motto of "The shipyard with a tradition."

In order to conserve length, the quarters amidships in these vessels are two decks high and relatively short, giving a maximum length for hatches and cargo handling gear. They are rigged with two masts and six king posts, carrying twenty-one booms, one of 30 tons capacity, one of 10 tons, 11 of 5 tons, and 8 of 3 tons. These serve seven hatches, all 18 feet wide and of varying lengths, the longest being 35 feet.

All masts, posts and booms are of steel, the masts being of steel right up to the trucks, eliminating the

Principal Dimensions of Motorship California and of Old Steamer Californian

	Steamer	MotorShip
Length overall	429' 6"	461' 0"
Length between perpendiculars	413' 0"	445' 0"
Beam, molded	51' 0"	59' 8"
Depth, molded to shelter deck	33' 6"	39' 0"
Contract draught	26' 0"	28' 6"
Displacement at contract draught	11,970 tons	16,500 tons
Deadweight at contract draught	9,500 tons	11,000 tons
Cargo capacity including deep tank ballast		650,000 cu. ft.
Contract speed	10 knots	11.5 knots
Normal fuel capacity (coal)	1182 tons	14,000 tons
Reserve fuel capacity in deep tank		760 tons
Normal radius	6000 miles	25,000 miles

usual wooden plug top masts.

The cargo handling machinery for these ships has been most carefully selected, and consists of fourteen double geared winches, and two Shepard Crane & Hoist Company's winches on each ship, the fourteen winches for the Californian being manufactured by the American Engineering Company and the winches for the Missourian were made by the Maine Electric Company. Each winch is driven by a thirty H. P. electric motor of the "Mill Type." The motors and the controllers for the Californian were supplied by the Westinghouse Manufacturing and Electric Company. Those for the Missourian were furnished by the General Electric Company.

The propelling machinery consists of two Burmeister and Wain six cylinder, single-acting, four-cycle Diesel engines of the cross-head type. Each engine is rated at 2250

Diesel I. H. P. and 115 R. P. M. Cylinders are 740 mm. diameter by 1150 mm. stroke. Thrust bearings are of the horseshoe type, and the 14-foot diameter propellers are manganese bronze.

Electricity for engine room auxiliaries, deck machinery, etc., is generated by four 65 K. W. direct current 230 volt generators each direct connected to a two-cylinder four-cycle Diesel engine. At sea only one set will be required, and in port a maximum of three, so that there always will be a stand-by set.

Both main and auxiliary Diesel engine sets are nearing completion in the shops of the Wm. Cramp and Sons Ship and Engine Building Company, Philadelphia.

All deck machinery, including windlass and steering gear and all engine room auxiliaries, except one small auxiliary steam driven air

compressor for charging air bottles, are electrically operated. The steering gear is electric hydraulic drive.

There is one 120 H. P. electrically driven two stage auxiliary air compressor.

A donkey boiler 48 inches diameter by 108 inches total height is installed to generate steam for heating purposes and for fire extinguisher service.

The Rich fire detecting and extinguishing system is also fitted, in conjunction with steam and CO₂, the latter being carried in flasks located on deck.

No effort has been spared in these ships in obtaining only the best in workmanship and material, and in the selection of auxiliaries, so that, when they go into service, it is expected that they will rank with the best freighters in the world in economy and reliability.

DECK MACHINERY OF THE WILLIAM PENN

By G. A. PIERCE

Electrical Engineer William Cramp & Sons Ship & Engine Building Company

ONE of the recent developments in marine engineering is the tendency to use electric motors in place of steam engines for driving ship's winches, windlasses, capstans, steering gear, pumps, blowers and other auxiliary machinery. This tendency implies the general recognition of two facts: in the first place, that reliable marine motors are now available; and secondly, that motors are more satisfactory than steam engines for auxiliary service.

The reliability of motors on shipboard has been amply proved by their records on both naval vessels and motorships. Motor manufacturers have had difficulty in building practical electrical equipment for ships, but increasing experience and a better knowledge of marine conditions are providing the remedy for such troubles, and it can be proven conclusively that the cases of motor failure have been due to installing apparatus which was not at all suitable for shipboard use.

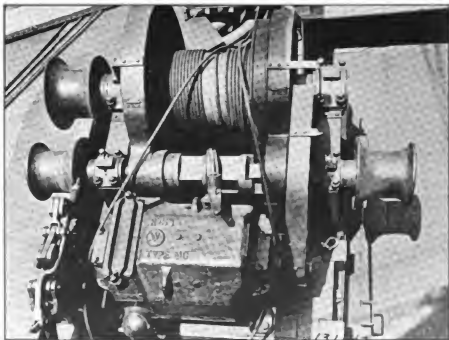
As regards the desirability of motors from an operating standpoint, such tests as are available indicate that an electric deck auxiliary system requires only from one-third to one-quarter the amount of fuel needed by a corresponding steam system, so that substantial economies can be obtained through the use of motors. In addition, electric wires are far more convenient, economical, and satisfactory than

steam pipes for distributing power throughout a ship.

The designing of marine auxiliary motors is, however, still in its early stages, and no generally accepted standards have as yet been developed. Consequently it is believed that a description of the construction, control, and performance of the winch motors of the U. S. S. B. motorship William Penn, which are of an entirely new design, will be of interest at this time.

The M. S. William Penn

The William Penn is the Shipping Board's first motorship. She is a cargo vessel of 12,358 tons dead-weight capacity and is propelled by two 2250 I. H. P. Burmeister and Wain Diesel engines direct connected to her propellers. Her hull was built at the Gloucester Yards of the Pusey & Jones Corporation, and she was fitted out by William Cramp & Sons Ship and Engine Building Company. She is allocated to the Bar-



View from above of one of the cargo winches on the William Penn showing electric motor and arrangement of gearing and clutches

ber Lines, where she is being used in the Far Eastern trade.

Practically all of her auxiliaries are motor-driven, the power being supplied by three 65-kilowatt Diesel-engine-driven generators, supplying 220-volt direct current. Most of the below-deck motors are of foreign make; but those for the deck winches, anchor windlass, and steering gear were supplied by the Westinghouse Electric and Manufacturing Company in consultation with the William Cramp and Sons Company, and these form the subject of this article.

There are altogether eleven deck-winches on the William Penn, ten being used for cargo handling, and one in the stern for warping. They were built by the American Engineering Company of Philadelphia in accordance with the Cramp Company's particular requirements. They are of compound gear type with gear ratios of 12.5 to 1 and of 26.45 to 1, from motor to drum, with the hoisting drum 18 inches in diameter. Each winch has three gypsy heads, two of which are on the first reduction, or counter, shaft and are used for handling light loads and whips. The winches are designed to lift 5000 pounds on the first gear ratio and 10,000 pounds on the second. A $\frac{3}{4}$ -inch steel hoisting line is used on the drums.

The Winch Motors

In designing the winch motors it was recognized that they must be very different from similar machines for land service, and special attention was given to their mechanical strength, waterproofing, ability to withstand high temperatures, and their speed characteristics.

Great strength is necessary to withstand the rough handling these motors are bound to receive, so they have been built with cast-steel frames and extra large shafts and bearings. The commutators and brushes have also been made especially large in order to eliminate frequent renewals of these wearing parts. The armatures are of especially small diameter to reduce the flywheel (WR²) effect. This results in an appreciable saving in power when all of the winches are in operation and permits a reduction in the generator capacity.

The frame, which totally encloses all of the working parts of the motor, is split horizontally to permit access to the interior. The joint between the two parts is made waterproof; and for the same purpose, the handhole covers are provided with



View on deck of William Penn showing arrangement of electric cargo winches, controllers, and booms

gaskets; the wires enter through a special watertight junction box; and the shafts are made watertight by S. E. A. rings. All small parts usually made of steel, such as springs and bolts, are made of non-corroding metal. Thus, these motors are capable of withstanding total submergence.

But the arrangements that insure waterproofing also prevent ventilation; and since these motors are liable to be operated when exposed to the full force of the tropical sun, special precautions had to be taken to prevent injury due to high temperatures. Internal heating was, therefore, reduced to a minimum by making all current-carrying parts of liberal proportions, thus cutting down the losses due to resistance; while practically all of the coils are provided with water- and oil-proof mica or asbestos insulation.

The field windings have been so designed that high speeds are obtained with the empty hook and light loads, and low speeds with heavy loads.

The nominal rating of each of these motors is 30 H. P. at 220 volts.

Brakes

Each winch motor is provided with a brake, which is released when the current is turned on and is promptly applied and holds the load when the current is turned off. The brake parts are of non-corroding metal, and the bearing pins of the shoe mechanism are of bronze with brass bushings to prevent sticking. The operating coil is imbedded in a waterproof cement and is enclosed in a

watertight housing. Means are provided to release the brake when the current is off, in case of necessity.

Controllers

The controllers are operated by vertical brass handles, which can be arranged so that one man can operate either one or two winches, as desired. The mechanism is enclosed in a cast iron case, with doors in three sides, giving ready access to the interior. These doors are watertight even when totally submerged. The operating parts are interchangeable as far as possible and can be readily renewed. A small knife-switch disconnects the controller from the line so as to permit inspection and repairs without interfering with the operation of the other winches.

The necessary resistors are of non-corroding cast iron and are enclosed in waterproof cases. Ventilation is provided by openings with covers which are raised and lowered by means of a hand wheel. These covers are electrically interlocked with the controllers, so that no motor can be started unless the covers of its resistor are open.

Operation

Moving the controller handle in either direction from the vertical position releases the brake, starts the motor in the corresponding direction of rotation, and brings it up to full speed in several steps. Moving the handle back towards the vertical position reduces the motor speed; but if the load on the hook is sufficiently heavy to lower by its own weight, dynamic braking is automatically applied.

In this process, the winch motor is transformed into a generator operated by the weight of the load. Since, under these conditions, the speed of a generator depends upon the current being generated, the speed of the winch motor (and therefore of the descending load) can be regulated with great nicety by means of the controller. The use of this method greatly increases the speed and safety of handling the cargo; and it also effects some economy as well, since some of the current generated returns to the line and helps to operate the other winches.

When the controller handle is moved to the off position, the full force of dynamic braking is applied, thus checking the speed of the load smoothly and almost instantly. The mechanical brake is then automatically applied.

In case of an overload on the motor or the failure of the line voltage, the motor is automatically disconnected from the line by a circuit breaker, and the mechanical brake is applied. By bringing the

handle of the controller back to the off position, the motor is re-connected; but if the cause of the trouble has not been removed, the circuit breaker immediately opens again.

Other Motors

The anchor windlass motor is similar in design to the winch motors but is considerably larger, having a capacity of 68 horsepower. Its controller is mounted below decks and is operated by a hand wheel above the deck.

The steering gear motor, which operates the hydraulic pump of the steering gear continuously, has non-corrodible parts, impregnated windings, and bearings that will operate at an angle.

Performance and Tests

Tests on the winch motor gave the following results:

Rope speed, no-load, hoist.....	457 ft. per min.
Rope speed, no-load, lower.....	337 ft. per min.
Rope speed, 5000-lb. load, hoist.....	170 ft. per min.
Rope speed, 5000-lb. load, lower.....	470 ft. per min.
(The above figures are for operation on high gear.)	

The maximum continuous cargo-handling capacity of each winch mo-

tor was found to be 45 tons an hour. That is to say, the motors could handle cargo at this rate indefinitely without injury, if the loads could be supplied to them.

When operating with two winches lifting 4000-pound loads, 80 tons per hour can be handled by each pair of winches, and the ship could be loaded at this rate in 30 hours of continuous operation.

However, it was found that the speed of loading was dependent upon the dock facilities, as the winches were able to handle cargo more rapidly than it could be supplied to them.

The fuel consumption of the auxiliary Diesel engines when supplying current for electric lighting, all auxiliaries, and all six winch motors, was 90 gallons of oil per 24 hours

day, the winches being in use for 8 hours.

PROGRESS IN MOTORSHIP BUILDING

An Interesting Analysis of the Present Condition in Diesel Engine Propulsion

FULL-POWERED Diesel-engined vessels of over 2000 gross tons increased in number from 107 on June 30, 1920, to 145 on June 30, 1921, and in gross tons from 462,000 to 692,000, says Commerce Reports. There has been a remarkable development in the ten years which have elapsed since the first large motorship was built, especially in view of the fact that during the war construction of vessels was largely confined to standard types. While the gain in steam tonnage, exclusive of motorships, was not quite 9 per cent in the year ended June 30, 1921, ocean-going motorship tonnage increased 50 per cent. The United Kingdom leads, with 34 ships over 2000 gross tons each, aggregating 217,000 tons. The United States is fourth, with 28 vessels totaling 86,000 tons, as will be seen from the table below.

In addition to the large full-powered motorships there were 553 small Diesel-engined vessels, aggregating

210,118 gross tons. Of this number, 59 were American vessels, totaling 27,521 gross tons.

Auxiliary Sailing Vessels

The increase in sailing vessels equipped with Diesel or semi-Diesel engines for auxiliary power has also been rapid. On June 30, 1915, only 45 ships, totaling 13,000 gross tons, had auxiliary Diesel power; on June 30 last, 777 ships, of 342,530 tons, had such installations. The United States leads in this kind of ton-

nage, as it does in sailing vessels, and owns 61 ships, aggregating 60,103 gross tons.

The complete list of motorship vessels, both full-powered and auxiliary, on June 30, 1921, comprised 1478 vessels, with a total gross tonnage of 1,244,418.

Although it is frequently stated that British steamship companies are conservative, it will be noticed that they have doubled their motorship tonnage within the past year.

Tonnage of motorships over 2000 gross tons each

Countries	June 30—			
	1920		1921	
	Number	Gross tons	Number	Gross tons
United Kingdom	19	108,713	34	217,104
Denmark	16	93,295	21	121,580
Sweden	14	63,951	20	91,681
United States	22	59,807	28	86,457
Norway	19	68,750	21	85,032
Italy	5	24,102	6	26,449
All other	12	43,071	15	63,467
Total	107	461,689	145	691,770

EUROPEAN MARINE NOTES

Impressions of a Californian Abroad

SINCE my last letter to Pacific Marine Review there has been no very great change in the labor situation in British shipyards. Improvement is manifest in some localities, mainly in the partial abandonment of the "ca' canny" principle and in the improved output per man, while in other locations conditions are becoming much more involved and complicated.

A rather ridiculous example of the latter condition was shown in the stand taken by the Boilermakers' Union in the shipyards and repair yards on the Mersey in and around Liverpool. The Mersey Boilermakers' Union had about 1000 of its members more or less constantly engaged on repair work. The employers have been introducing in repair jobs the use of the oxyacetylene flame for cutting up plates and burning out rivets and other processes incident to the repair of marine boilers. Two men with the assistance of the oxyacetylene flame could do the work formerly done by twenty-three men with hand tools. The Boilermakers' Union took the stand that it was perfectly proper for the employers to use the oxyacetylene flame, but that with each oxyacetylene flame used they should employ twenty-three boilermakers. The result is that the work is being done now with any men available trained to the use of the oxyacetylene flame, and the 1000 boilermakers who formerly were working at repair jobs are largely sitting on the bench waiting for work.

Removal of War Bonus

There have been several small strikes, due to the removal of the war bonus, as, for instance, the apprentices in the shipyards on the Clyde. There has also been considerable trouble caused by the decision of the ship joiners that no joiners should work overtime under any consideration.

The consensus of opinion seems to be that daylight is in sight for the return of shipyard labor to normal conditions, and the principal difficulty now facing the shipbuilder in Britain is the handicap in competition with continental builders, due to exchange conditions, and the general handicap common to all shipbuilders in the world—that of high construction costs and low market value of the finished product.

Value of Ships

Six German sailing vessels of 1500 to 2300 tons gross were sold recently on the Baltic Exchange, London, at

an average of 8s. 3d. per ton. A new, handy sized steel cargo steamer sold recently on the Northeast Coast at £9 per ton, which was less than one-half the cost of construction, and it may be taken as a general fact that any vessel finished during the last six months, or any vessel now building, will have cost at completion more than twice the actual market value.

As was pointed out in Fairplay in a recent issue, this condition is nothing new in the shipbuilding industry. During the whole of the last century every boom in freight rates and shipping prosperity brought in its wake a long period of depression. As soon as freight rates at sea get to a point where shipping is abnormally profitable, there is a shipbuilding boom, too many ships are built, and the shipping business of the world is in for four or five years of unprofitable business. Since boom freight rates are generally coincident with wars and wars generally bring in their wake depressed conditions in world trading, the depression in shipping is usually more aggravated than the general business depression.

Stability of Old Firms

Old established shipping firms who have gone through one or more of these depression periods in the past foresaw what was coming and wisely used a large portion of their boom time profits to establish large surpluses for the depression of the value of their tonnage, and the majority of such companies are now in a position to weather the storm and come through the depression period with unshaken stability.

In Great Britain, however, and all

over Europe, just as at home, the boom in shipping brought on a flock of new companies which bought tonnage at wartime prices and used the greater part of their large earnings for ruinously expansive programs or for the payment of high rates of dividends on large capitalization. Such companies now find themselves with vessels which have for them a book value of from two to five times the actual market price, and such companies are either in the hands of a receiver or struggling along in very desperate circumstances.

I have been particularly struck with the attitude of British and Northwestern European shipbuilders and ship operators at the present time as contrasted with the attitude of American shipbuilders and operators as I saw it on the Pacific Coast at the beginning of the present year. Practically all of the shipbuilders here are carrying out research and experimental work looking to improvements in hull and in motive power, and this on a scale that would lead you to believe that a boom in shipbuilding was imminent.

The Urge of European Shipping

Their reasons for this activity should be interesting to the proponents of an American merchant marine. They are very simple and are based entirely on the knowledge that Great Britain, the Netherlands, Denmark and the Scandinavian countries must have ships. They live on ships, shipbuilding and what ships bring to them. Thus we see, for instance, the East Asiatic Company of Copenhagen, Denmark, at a time when profits from the operation of ships are practically nil, building at Leith,



Auxiliary sailing vessel København of the East Asiatic Company

Scotland, a beautifully equipped five-masted steel sailing vessel with 5000 tons deadweight capacity, fitted with a 600 horsepower Burmeister & Wain motor and a two-bladed feathering propeller, as a training ship for officers and men for their fine fleet of motorships. Denmark has not as much productive acreage as some countries in California, but the ramifications of her shipping companies reach into every port on the globe.

British Bread Wagons

In all these countries, and particularly in Great Britain, one is impressed with the necessity for large fleets of ships simply for the sake of bringing into the country sufficient food to keep the inhabitants alive. The figures for Great Britain would indicate that in foodstuffs alone over 16,000,000 tons are brought into the United Kingdom every year from across the sea. The great bulk of this material comes from quite distant points—Australia, the two Americas, or the Orient, and the tonnage would in itself, without any reference to raw materials for the manufacturing industries which are necessary in order that the people of Britain may buy this food, easily account for a fleet of about 5,000,000 tons deadweight of shipping.

England has the densest population of any country in the world, and while she remains in that condition every man, woman and child knows that ships are necessary; therefore, ships will be built and operated by Britain, and so the British shipbuilder knows that anything which he can produce in the way of improvements to facilitate the building and operation of these ships will find profitable use.

Sir William Noble summed up this attitude very nicely in an address delivered at Newcastle-on-Tyne to the Northeast Coast Institute of Engineers and Shipbuilders at their meeting of October 14, 1921:

We were proud of our merchant navy before the war, but it was the searchlight of the war which revealed to us its true relation to the life of the nation. Few among us ever thought of the peaceful merchantman as an instrument of war and yet our merchant fleet became one of our fighting units, almost, if not quite, as important as our warship fleet. It was found that the one was complementary to the other, and we know what heroic work was done by the officers and crews of merchant ships. Without those men and without those ships neither we nor our allies could have issued victorious from that stupendous conflict. As a matter of sober fact, a predom-

inant mercantile marine is necessary for the safety and well-being of the whole community. No one can view any decline in the maritime supremacy of this country without alarm. Only across the sea can we gain access to the markets of the world, and, therefore, our merchant fleet is our only means of trading at an economic advantage with other countries.

Cheap food and cheap raw materials are the foundation of our commercial prosperity. They cannot be obtained unless we have tonnage sufficient to bring them at cheap rates. One hundred years ago the population of this country was about 16,000,000. Presumably, that was the population which the land could feed comfortably. Nowadays, in spite of our war losses, we have, owing to industrial expansion, about 47,000,000 to feed and clothe, and an aspiration that the general standard of living should be raised for the mass of the people. Therefore, we must import food and raw materials to keep us going throughout the whole gamut of our national life.

Depleted Tonnage

When war broke out in August, 1914, the world's steam tonnage was 42,500,000 tons gross. It had grown year by year following the rapid expansion of the world's commerce caused by the application to industry of steam and electrical power. Of this total the United Kingdom tonnage was represented by nearly 19,000,000 tons—44½ per cent of the whole, but in real efficiency a much higher percentage. Steamers of 1600 tons gross are usually taken as the

standard for overseas trading and 90 per cent of the United Kingdom tonnage was of this size and upwards. Further, 68 per cent of this class of tonnage was under fourteen years old—the most up-to-date tonnage in the world in type, size, speed and equipment. This was shown by the fact that the British mercantile marine was responsible for over 50 per cent of the world's seaborne commerce. All nations were dependent on us. As a matter of fact, 30 per cent of the trade between foreign countries was carried in British bottoms, and the work of the British mercantile marine represented a cash value in invisible exports of something like £100,000,000 as a contribution to the national resources.

It may be asked how did we acquire such a mercantile marine? It was not accomplished in a day or a year, it was the slow growth of some 200 years of patient endeavor, and was the outcome of that spirit of adventure combining initiative, resource and courage which has built up the Empire. Shipowners, shipbuilders and engineers, animated by this spirit, took risks scarcely calculable, and in the end we had the greatest mercantile marine the world ever saw.

It is the simple truth that the British mercantile marine has developed because of economic necessity, and that fact may well give us confidence when we are tempted to fear the friendly rivalry of competitors who have been actuated more by sentiment than national need.

Baltimore City Fire Boat Torrent

A NOTABLE addition to the fire-fighting fleet of the city of Baltimore is nearing completion at the lower yard of the Baltimore Dry Docks plant of the Bethlehem Shipbuilding Corporation. This vessel represents the most modern type of fire-fighting marine equipment, and embodies the valuable experience of the fire board as gained from operation of the present fireboats Deluge and Cataract.

The vessel is 121 feet 4 inches long, has a beam of 28 feet and a depth of 15 feet, drawing when fully coaled about 10 feet. She is equipped with the best fire-fighting apparatus, including five large monitors, one of which is mounted on a high steel tower. Suitable quarters are provided for housing the crew aboard.

The propelling plant consists of a double cylinder, inverted steam engine of 20-inch bore and 20-inch stroke. Two coal-fired B. & W. boilers working under induced draft furnish steam.

The main fire pumps consist of two turbine driven centrifugal pumps, each having a capacity of 4500 gallons per minute, at 150 pounds nozzle pressure. Two auxiliary pumps for small fires, washing down, etc., are also installed. These pumps are engine driven, and have a capacity each of 1000 gallons per minute.

The Torrent will be delivered to the city early in December and take its place as a valuable addition to the protection of Baltimore's increasing waterfront property.

MARINE ENGINEERING

WARPING OF GEAR CASES

By John L. BOGERT

A CONSIDERABLE amount of trouble has been experienced in the operation of reduction gears on shipboard. The evidence of trouble is generally "pitting." To prevent "pitting" on the driving face of a tooth, four things must be kept constantly in mind: the character of the material constituting the tooth, the shape of the tooth, the tooth pressure and lubrication.

Mr. S. K. French, while general superintendent of the propulsion machinery department at Hog Island, Pennsylvania, had under his personal supervision the installation and operation of 122 gear sets. He also had occasion, while in the service of the American International Shipbuilding Corporation, to inspect a large number of gears of all makes from other shipyards.

Careful study of the subject and close observation convinced him that most of the trouble arose from the warpage of the gear case while in operation, due to the twisting of the hull as the ship works in a seaway.

His conclusions not being shared by many leading engineers, he designed a piece of apparatus that could be used to accurately measure the warpage of any gear case while the vessel was at sea. This piece of apparatus consisted of a tram built like an engineers' transit-head with a seamless drawn steel tube extending 7 feet each way from the center, 14 feet from end to end. To secure the necessary rigidity for this tube it was trussed with pianoforte wire. By means of a pin gauge to which was attached a Starrett indicator, readings could be taken in thousandths of an inch. By stationing two men, one at each end of the tram, readings could be taken at diagonally opposite corners of a gear-case simultaneously. In describing the working of the apparatus, Mr. French says:

"It was observed while taking these checks (observation measurements) that a long heavy swell passing fore and aft under the hull caused nearly as much deflection in the gear as a very rough choppy sea would do in bad storm conditions."

He placed one of these trams on board the S. S. Carenco, a turbine-driven double-reduction geared ship of 7825 D. W. T. capacity. The readings secured on this ship are shown in the accompanying chart, and the

This paper and the diagram on the opposite page should be of great value to designers of reduction gears for marine power plants. Mr. French has evidently put a great deal of thought and time into this research work, and we are indebted to John L. Bogert for his interpretation of the work.

figures given at the corners of the square which is intended to represent the gear case, are the total deflection of the indicator during each movement of the ship due to a swell or wave-crest passing under the hull.

The reader will note that Diagrams 21 and 22 show a maximum distortion. Ship was then operating in a heavy gale, 400 miles off Cape Henry. It will be noted that the heaviest deflections are on the windward side of the ship as indicated by the arrows. Note that Diagrams 5, 6, 7, 8 and 9 were taken within a period of forty-five minutes on November 9 while ship was operating in a moderate sea and under varying conditions of wind and wave, as indicated by directions of arrows shown on chart. This condition was purposely caused by swinging the ship off her course, to bring the sea and wind at points as indicated.

Note that Diagram 30 was taken after the ship had passed inside the Capes and was operating in perfectly smooth water at full speed. The readings indicate the rigidity of the bridge arm. These readings were taken as shown on the chart when the ship was in ballast.

"On the trip over to Glasgow with the ship loaded, these deflections

reached as high as .050 of an inch on diagonally opposite corners of the gear-case; and from these figures, it is perfectly apparent why we cannot expect to get perfect operation of a double-reduction gear set, or any gear on a marine job if it is so designed and bolted down to the hull of the ship that these motions will be transmitted to the driving gears. Also that one of the great elements that enter into the imperfect operation of marine gears is their not being properly lined up and secured, in which case the bending of the hull tends to exaggerate the out-of-line condition.

"The instant at which the gear is distorted to its maximum amount is also the instant at which the surges of the sea take effect on the propeller and raise its overload to 100 per cent.

"The gear-case on which this check was made has an over-all dimension of 8 feet 6 inches by 12 feet 4 inches. The driving face of the low speed gear is 5 feet 11½ inches from outside to outside.

"It is perfectly apparent therefore that at the angle with which the low speed pinion engages its driven gear less than 50 per cent of the driving face is in contact. Add to this 100 per cent overload with a gear which is already designed for a tooth pressure of 800 pounds per lineal inch of face, and you can readily see what the gear has to withstand—a load of over 3000 pounds per available inch of driving face, and this theoretically carried on line contact.

"Design the gear case for a three-point suspension, same as an automobile engine which has to withstand the same kind of strains, and let the propeller shaft absorb the out-of-line conditions; and not take it up in the gears themselves by bolting these large gear cases to a foundation which we know is going to bend. Thus the gears will be enabled to do their work while running in proper alignment, the same as in a land job."

Where possible, gears should be designed for tooth pressures below 500 pounds per lineal inch of driving face.

The foregoing is a very close copy of Mr. S. K. French's letter describing his tram. The blueprint and photographs were also furnished by him.



The French tram set up on gear case of West Carenco

STEAM SUPERHEATERS

Design, Construction, Application and Use

By H. B. OATLEY*

SINCE 1700, when the noted French physicist, Denis Papin, inserted a heated mass of iron in a piston, so that the steam moving the piston might be kept freer from moisture, the advantages of superheated steam, the difficulties of properly designing apparatus for generating it, and the necessity for having prime movers so fitted as to use it effectively, have been known and, as time passed, have been more keenly appreciated by engineers throughout the world.

The present paper will be confined to four phases of the question, namely:

- Fundamentals of design and materials used
- Characteristics and details of locomotive, marine and stationary superheaters
- Operating conditions where reciprocating or rotating prime movers use superheated steam.
- Results obtained by using superheated steam.

Design and Materials

Only the tubular form of superheater, and its use as an integrally-built live-gas or waste-gas superheater will be herein discussed.

Important factors in superheater design may be considered under the headings of efficiency, durability, accessibility and safety. A design to be of merit should have a high rating in these four fundamentals.

Efficiency may have three interpretations: efficiency in design, efficiency in operation, and efficiency in return on the investment.

Efficiency in design may be measured in terms of superheater bulk and weight, and by the draft retardation produced by its interposition in the path of the products of combustion. It is generally true that a superheater of minimum bulk will have a minimum weight and naturally offer a minimum retardation to gases. It also follows that superheaters located in relatively high gas-temperature zones have greater heat-transmitting efficiency; hence, are smaller and more advantageously used. In many cases waste-gas superheaters of not over 50 deg. Fahr. capacity have double the weight and bulk of 200-deg. Fahr. superheaters of the live-gas type. In the forego-

ing consideration of elements of design, equal capacities of the superheater should be made the basis of comparison.

Efficiency in operation is effected by the sustained cleanliness of both the gas-touched and steam-touched surfaces, by accessibility for inspection, tightening and repair of the superheater itself, or by the ease with which conditions existing in the vicinity and affecting the performance of the superheater may be corrected.

The character of the outer surface of the superheater pipes, whether smooth or corrugated, controls the ease and thoroughness with which it may be cleaned. It also limits the ability of the soot blower to thoroughly cleanse the superheater from soot and dirt. The predominant use of the smooth surface indicates a general acknowledgment by superheater designers and users of the heavy heat losses resulting from soot-coated superheaters, and the difficulties in cleaning rough surfaces. The importance of the heat losses possible due to soot will be better appreciated when it is realized that it requires five inches of fine asbestos to equal the heat-insulating capacity of one inch of soot.* The time required to blow soot from the superheating surface should be as brief as possible, in order to conserve steam.

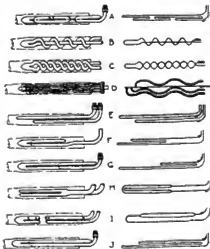
Efficiency in return on the investment is affected by first cost of the superheater, installation expense and maintenance charges compared with the financial gain obtained. Generally speaking, fuel economy is first considered among the advantages of superheating, although in many cases, particularly in railway and marine service, the results of large water economy aggregate a considerable item. Reduced boiler maintenance, because of the smaller quantity of fuel burned, and water evaporated, per horsepower-hour frequently appears as a credit due the superheater.

Durability is measured by the life of the superheater parts, and by the period elapsing between repair periods. This feature is affected by service conditions, and by the position of the superheater with respect to the path of the gases. In superheaters located where soot accumulation is rapid and where moisture

may reach it, the soot will produce greater deterioration than where the superheater elements are subjected to live gases. This to some extent may explain the attempt to protect, by cast or malleable iron, steel unit pipes of waste-gas superheaters. The deposit of soot is naturally less where gas velocities are high, and explains the preference of the majority of designers for live-gas superheaters, and for the high gas velocities that are obtainable with such designs.

Accessibility should embrace "get-ability," not only of the superheater but of adjacent parts of the boiler and other details. A minimum number of steam joints in the superheater, and their location at a point where inspection may be made without shutting down the boiler, or involving excessive labor and trouble in making such inspection, are to be considered under this head.

Safety rarely becomes a problem in superheater design, inasmuch as the size of superheater parts is small in comparison with boiler drums and also because the stored energy in the entire superheater is relatively small. Furthermore, the factor of safety in both units and headers, due to the consideration of durability, and the small sizes of parts, is relatively high. In case of failure of a unit, damage to property is negligible and injury to the operating personnel practically unknown. A representative of one of the largest insurance companies recently made the statement before a board of boiler inspectors that his company, and he believed that other



A few of the forms of superheater units in use

*Chief Engineer, Locomotive Superheater Co. Mem. Am. Soc. M. E.

Condensed from a paper presented at a meeting of the Eastern New York section of The American Society of Mechanical Engineers, Schenectady, N. Y., January 13, 1921.

*Paper Industry, November, 1920, p. 1187.

companies, had not received a single claim in connection with a superheater failure.

Characteristics and Details

It may not be realized that the locomotive superheaters in use in this country alone have an aggregate horse power of over 60,000,000. All of these superheaters have tubular structure, and are of the bare fire-tube live-gas type. What is true in the United States as to type and structure of superheater, is true in other countries of the world where steam locomotives are in use.

The limitations imposed in the design of a superheater for a locomotive boiler are, in the author's opinion, more severe than for any other use. Space is restricted, weight conditions important and the requirements for high degrees of superheat very pronounced. The compactness of the boiler provides severe operating conditions for the superheater, because of the quality of the steam delivered to it. Steam velocities existing within the superheater units, gas velocities passing over the outer surface of the units and the necessity for strong and rugged structure to withstand the severe vibratory conditions encountered while the locomotive is running, require great care in the design and construction of the equipment.

The superheaters installed in more than half of the steam locomotives in this country weigh from 3.0 to 4.0 lb. per maximum cylinder horsepower of the engine. These figures are interesting, particularly in comparison with the running-order weight of engine per maximum cylinder horsepower, which, on the modern locomotive, ranges between 115 lb. and 160 lb. The figures in Table I show these ratios for the United States Railway Administration standard engines built during the war.

The steam velocity in units of locomotive superheaters frequently is in excess of 12,000 ft. per min. This may be startling to many power-plant engineers who consider 6000 to 8000 ft. per minute as the upper limit of steam velocities in pipe lines.

Gas velocities through the flues of locomotive boilers, as in stationary power plants, vary through a wide range, and it is not unusual to find velocities of 8500 ft. per min., or more than 90 m. p. h., when locomotives are working to their capacity.

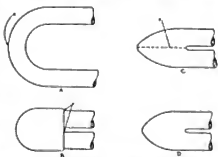
The form of top header, termed the "modified through-bolt" design, is fitted in nearly one-half of the superheater locomotives in this

country. This header is made of high-grade cast iron, is rather intricate in coring and good foundry practice is required in order that a satisfactory header may be obtained. Alternate cross-passages carry saturated steam and superheated steam. Expansion is provided, as will be noted from the coring which separates adjacent fingers, without setting up excessive stress in the header. This construction at the same time reduces to a practical minimum the amount of wall surface subjected to different qualities of steam.

There have been numerous forms of header, in which cast-steel and steel-plate construction have been used. Experience has demonstrated, however, that there is no necessity for using cast steel.

Units in locomotive superheaters are universally of cold-drawn seamless steel tubing and range from 1½ in. to 1 in. outside diameter, with the 1½-in. size as the most generally used size.

Units designed for use in fire



Some of the methods of forming the closed end of return tube superheater units

tubes have undergone a most interesting development. The diagram shows a few forms, all applicable to a fire-tube superheater, and some possessing features applying equally to a water-tube boiler installation.

In summing up the question of superheater unit, it is considered that unit J, which is really a world-standard form, represents the highest average of any thus far developed, particularly when considered on the basis of—

- a Efficiency in the abstraction of heat from the gases
- b Thorough mixing and uniform superheating of the steam
- c Better equalization in the area of gas passage and more constant gas velocity
- d Maximum superheating surface
- e Minimum resistance to flow of gases when (c) and (d) are considered
- f Less opportunity for deposit of soot and cinders by maintaining relatively high gas velocity through length of flue

g Cost.

Units H and I are forms not thus far used, but experiment has demonstrated that they will meet, from an efficiency standpoint, all of the advantageous features of the standard unit J and from a practical operating standpoint would not differ appreciably from the standard unit. They would be more expensive to manufacture, and under present conditions are, therefore, not generally preferred.

In design and installation of units two important features are (a) return bends and (b) the jointing of units to the leaders.

Sketch A is the simplest form and is merely a pipe bent into a "U" or hairpin form. Diameter of tube and distance between the two pipes have naturally minimum limits if distortion in the bent portion of the pipe at X is to be avoided. For fire-tube superheaters, where a close spacing is essential, bending of the pipe in this way is obviously prevented.

Form B shows two pipes fitted to a return bend. The return bend as used is almost always of cast steel, and the pipes are threaded into it. In designs where expansion stresses are excessive, it is necessary to acetylene or electric weld the joint Y between the return bend and the pipe, in order to insure permanent steam-tightness.

Increasing demands in capacity, particularly for locomotive and marine installations, require a minimum of obstruction in the flue and, for a number of years, pipes have been joined by forming their ends, and welding the two pipes together. The extremely severe service conditions of a superheater have demonstrated that the durability of electric or acetylene welds is not sufficient to insure requisite life and freedom from possible steam leakage. Long experiment and persistent efforts to develop practically a perfect bend resulted in the form now in world-wide use, and termed the "forged" return bend. Particular points of advantage are uniformity in the character of the metal, freedom from any roughness or obstruction, either within or without the return bend, and a strength which is never less than that of the pipes of the unit from which the return bend is made.

The jointing, or connection, of superheater units to the headers, or collector castings, is another detail which has passed through numerous stages of development. The term "permanent" as here used covers joints which are welded, or are made by rolling the pipe in the header, either method requiring considerable work and time for removal.

Where pipes are welded to the header, actual breaking of metal is necessary in order to remove a unit. Where pipes are rolled into a header, in a manner similar to the setting of a tube in a boiler, it is necessary to remove a handhole plate, or a plug, and then to crimp the expanded end of the unit pipe and drive it out of the header. It is, of course, possible to cut off the unit outside of the header, and to remove the cut-off portion separately. This is perhaps better practice, as it makes available, for later attaching the unit to the header, material which has not been stressed and fatigued by previous rolling and expanding. Obviously, to cut off the end of a unit, applicable to fire-tube boilers, makes necessary welding on a short piece of pipe, or rebending the unit, in order that it may reach the header, and at the same time occupy its proper position in the boiler tube. Either method involves considerable time and expense.

Disconnected, or detachable, unit ends have been in almost universal use for locomotive and marine superheaters, and to a considerable extent in stationary practice. The advantages of disconnectable units are obvious and recognized fully in all lines of superheater use.

The gasket joint is to be preferred where the smaller diameter and more flexible superheater pipes are used. With small pipes the joint is easily drawn up normal to the seat and, because of the flexibility of the pipe, expansion and vibration cannot produce leakage.

In the locomotive field where unit pipes are of larger diameter and consequently more rigid, it has been found of decided practical advantage to use a metal-to-metal spherical joint. This form has been developed in the United States and its adoption has followed in a number of other countries.

Some Considerations in Marine Practice

In marine practice fire and water-tube boilers are met with. The former have, for years, been used almost exclusively in merchant ships, while the latter, for a decade or more, have been practically a standard in naval construction. During, and since the war, water-tube boilers have had greater application to passenger and cargo vessels.

Heine boilers with superheaters were fitted in a number of war-built American vessels. The unit pipes are parallel to the water tubes, running through both water legs, and being attached, front and back, to the headers by rolled joints. The

use of this type of equipment has thus far been confined to American vessels built within the past four years.

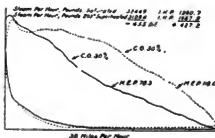
The Power Specialty Company's waste-gas superheater was applied to both Scotch fire-tube and water-tube boilers fitted in some vessels built by the Emergency Fleet Corporation. The units in this design are of the covered type with extended surface. The covering is of cast or malleable iron slipped over the steel superheating tube. The units are attached to the header, as well as to the return bend, by rolled joints with handholes and covering plates opposite the pipe opening.

The Locomotive Superheater Company's type M apparatus has units, of the bare-tube type with forged return bends, connected to the headers by the recess gasket joint previously referred to. With this method of joining no handholes or hand-

b The gas area may be made more favorable, because of the flexibility permitted by the superheater design.

The question is many times asked how it is possible to insert superheater units in the tubes of Scotch boilers without retarding the draft. The explanation is not difficult to understand, when it is realized that a reduction in fuel per hour of from 10 to 18 per cent is made possible through utilizing highly superheated steam. This means that the quantity of gas passing through the tubes is reduced in the same proportion as the quantity of fuel burned per hour, and that therefore a smaller area is sufficient if the same gas velocities are obtained. The obstruction caused by reduction in gas area, resulting from the insertion of the superheater units, is calculated in the design and in determining the diameter of the superheater pipe. The number of boiler tubes receiving the units, as well as the length of the unit, are varied to meet the conditions. It is also interesting to point out that the resistance of the gases passing the unit has, by careful test, been shown to be not more than the resistance encountered in passing a retarder having one turn. The use of retarders in marine practice is quite general, and they are frequently given from one and one-half to three turns. If a boiler fitted with retarders of two turns should be considered, it will be quite possible to remove the retarders, apply superheaters, obtain the fuel economies consistent with the type of prime mover used and, without increasing the air pressure from the fan, to burn, if occasion requires, a larger amount of fuel per hour and, assuming that the prime movers in the ship are suited, to obtain a very much greater indicated or shaft-horsepower output.

The superheater installation in the S. S. Cuba, the first passenger vessel under the American flag to receive turbo-electric propelling equipment and to use high degrees of superheat, may illustrate more fully the points referred to. There were originally four Scotch boilers supplying saturated steam to triple-expansion engines of 2400 i. h. p. These boilers were, if anything, small for the power to be developed. The space available in this vessel for the boiler room could not be increased without prohibitive expense and cutting down on the space usable for other purposes. It was desired to provide 3000 shaft hp. in the new installation of propelling equipment, and the question immediately arose



Cards from a locomotive showing improvement in economy due to the use of superheated steam.

hole covers are required.

The headers, to which the units are attached, are made of either high-grade cast iron, cast steel or forged steel, as may be desired, and as may be deemed acceptable by the classification societies in the countries in which the ship is to be built. Attention is invited to the chief difference between the type M marine superheater, and the type A locomotive superheater. In the marine design, pipes of from $\frac{3}{4}$ in. to 1 in. outside diameter are used, and only one loop of the unit occupies a flue. In the locomotive type two loops of a unit occupy the same flue. In the marine type there may be from two to six loops in as many flues, depending on the proportions of the boiler and the degree of superheat specified.

In type M installations no change is usually made in the diameter of the tubes in the boiler from what would be fitted for saturated-steam operation. It is possible to do this because—

a The tubes in Scotch marine boilers have a relatively low ratio of length divided by internal area, and

as to whether the boilers would be adequate. The substitution of turbines for reciprocating engines naturally effected economy in steam, but without increasing boiler efficiency. The installation of fire-tube superheaters has not only increased the boiler efficiency, but has provided a more efficient working medium, the net result being that 3000 shaft hp. is being supplied from the original boilers.

In the marine field, the adoption of superheaters has gone forward more slowly due to a number of causes which, previous to the world war, made the question of relatively less importance. American ships were not to any extent then in competition with vessels under foreign flags and fuel costs were comparatively insignificant. Today this condition does not exist. Our war-built merchant fleet, which will be the nucleus of a greater American merchant marine, is now in competition on all seven seas against vessels flying other flags, and this competition necessitates the most careful study of operating costs. More than 75 per cent of the steam-driven merchant ships built abroad since the war have been fitted with superheaters, and fuel economies of from 12 to 18 per cent, depending on the type of propelling equipment, are being obtained by foreign operators. Fuel costs where they now are, or where they may be in the future, are compelling reasons why American marine engineers must adopt superheated steam, and other means of reducing fuel costs, or face handicaps which will militate against American success.

Many of those opposed to such betterment in operating conditions have contended that the personnel on American ships is unable to handle superheaters and equipment using superheated steam. To make such contention is a slander on American ability to do aboard ship what is being done in our power plants, and on locomotives.

It is doubtful whether our war-built vessels can be made quite as effective in the use of fuel as pre-war construction. This statement is made without the intention of criticizing the colossal task which the Emergency Fleet Corporation and Shipping Board performed from the date of its organization up to the armistice. For failure, however, to change their viewpoint subsequent to November 11, 1918, and for failure to make the changes which were possible and necessary in order that post-war construction should have high operating efficiency, consider-

able criticism may be given fairly to the officials in charge. It is only within the past nine or twelve months that a few ships have been so revised as to produce operating economies which will give them a more nearly even chance with foreign-operated vessels. The S. S. Eclipse may be cited as one instance of this character.

The original decision of the Emergency Fleet Corporation at the beginning of their program called for low-capacity superheaters giving not over 50 or 75 deg. of superheat. It was believed that this would be adequate to provide protection for turbines. Had the specified amount of superheat been obtainable under the severe conditions existing at sea, such a program would have been correct and justified. The many instances of turbine blades cut by water, after but a few thousand miles of operation, demonstrated that low-capacity superheaters, under the conditions stated, failed to provide the protection which was necessary. It is difficult to understand why the known successful means of fuel economy, all the data for which were in the possession of the Emergency Fleet Corporation in 1917, have not been utilized in the post-armistice program. Not only would the protection to turbines have been assured, but economy in fuel and increased cargo space, vital as they are, would have been assured. The tonnage of iron and steel, critical as it is, would have been reduced 50 per cent, so far as the metal entering into the construction of superheaters was concerned.

Operating Conditions

To go into the details of operating conditions would require more space than is available, and only a few of the more important factors will be referred to.

Increased steam temperature makes necessary provision for greater expansion of pipe lines, expansion joints, etc., than where saturated steam is used. In installing superheaters in existing plants, it is therefore necessary to determine what expansion is provided for, and if not adequate, provision must be made, or pipe-line difficulties will ensue.

Where reciprocating engines are using superheated steam, the valves must be of proper design and material, and suitable lubricating conditions must be provided by using oil of proper quality.

When turbines are to change from saturated to superheated steam, it is necessary to know that the turbine design is suitable, and what degree

of superheat may be used without distress.

Results Obtained

In locomotives, upward of 20 per cent in fuel economy is believed conservative as applying to the 33,000 locomotives, with high-degree superheaters now operating on the United States railroads. Road tests of locomotives are more difficult to carry out with the accuracy obtainable from stationary plants, but comparative results, on which conclusions may be reached, have fortunately been available through testing plants of the Pennsylvania R. R., Purdue University and University of Illinois.

In marine service interesting data have been collected, generally from the owners, for over fifty vessels ranging from 2800 to 16,000 dead-weight tons cargo capacity, some driven with reciprocating engines, some with geared turbines, and some having turbo-electric drive. Thirty-eight of these ships provided with superheaters averaged a coal consumption of 3.3 lb. per 100 dead-weight ton-miles, while for fifteen not so equipped the fuel consumption averaged 5.28 lb. per 100 dead-weight ton-miles. Comment on these figures would be superfluous.

The results obtained by using superheated steam in stationary power plants are more numerous, and very complete accounts of carefully conducted tests have filled the pages of the technical papers for a number of years.

In the railway field, where its adoption and extension has been most rapid and complete, there is a strong desire to go to even higher degrees of superheat than formerly, and hundreds of our locomotives are operating with steam at temperatures beyond any ordinarily found in either stationary or marine service.

The belief of many engineers, strengthened by considerable study of the problem, is that steam of 800 deg. Fahr. temperature is adaptable for general use, and that the results will be entirely justified and will prove gratifying to owners and operators of such plants.

ERRATA

In the October issue of Pacific Marine Review, on page 591, in an article by R. Z. Dickie on "Motor Shipbuilding in Germany," credit for quotation of the first three paragraphs should have been given to The Motor Ship, London. We regret that this mistake occurred.

THE BLOW-OFF COCK

ONE HUNDRED YEARS BEHIND THE TIMES

The First Answers the Chief

THE "Blow Off Cock" is a good name for this new department, so I would like to answer the chief who calls everything "junk" and wants to go back to the "simple life."

A note of his, "Freighters De Luxe," in the October number. He states that the average man going to sea is of one type. I think he is away off. At one time that may be true, but today no, as they are in at least three classes and each a class by itself.

In the first place any full born engineer who does not want to have everything clean and up to date and able to keep them so has no place at sea today except on one class of ship.

He states that generators, ice machines, wireless, etc., and all the other "mollycoddling" things, such as superheaters, are not needed. I wonder where he ever came from? They buried all of his class one hundred years ago, I thought.

"Running Water?"

As to running water in every officer's room, electric fans, etc., I would like running water myself, but so far never have had it. Electric fans are O. K. in a hot climate as a ship (i. e., ocean-going) don't always stay in a cool climate. Sometimes they go into hot climates.

The generators there should always be two (2) in every deep water ship and kept running all the time on a ship of any size. The engine and fire rooms are a little dark without them to make lights. Wonder if he ever thought of the value of a wireless set as a lifesaver? Also the daily press news from the outside world goes pretty good after you have been ten or twelve days at sea, and a good many aids it gives to navigation.

As to the ice machine, he either don't know anything about them or don't want to or enjoys rotten beef, sour food of all kinds, etc. The ice machine (should be two of them) is a great money saver for the ship owner and a life saver for the world.

What Are "Superheaters" For?

How about superheaters? I don't think he knows what they are for. If he did, he would not speak of them as mollycoddling junk, etc. The cost of superheaters should pay for themselves in a very short time in the fuel they save.

Any engineer can write to any company that builds a marine machine used on a ship and ask for dope on it and he will find the company will be only too glad to send him dope of all kinds, as they know that it may mean a lot to them to keep their machine in A-1 shape, and understand that all engineers don't know everything. I know I don't and never will, as all engineers can learn even from a person who knows nothing about engineering.

Possible Savings

Now here are ways I believe large sums can be saved. First, by using turbine generator sets as they can be run with little cost and upkeep, using superheated steam. I have heard engineers kick at them and say they are N. G. I don't agree with them at all, as they are the ones that are N. G. and not the turbine. It seems that a good many engineers are afraid of superheated steam and won't try it and so what happens. As for myself, I'll try anything within reason and try to make it work. If I fall down the first time I'll try and find my fault and try once more.

A good way to save fuel, electric lights, fans, etc., i. e., in the ships' officers' rooms: have the room door open out on deck and not into a hot alleyway or passageway next to the engine room door. Don't be afraid to put plenty of portholes in a room, as the fresh air goes a long way to keep a room cool and light, also is healthier. I think with a lot of fresh air you can sleep better. You know we have a saying, "Let there be light and there was light," and that saying is true aboard ship in a number of ways. Am I wrong in my ideas on the question or not? I don't think I am.

Now I should like to speak of one more thing. The writers are Pacific American Steamship Association and Shipowners' Association of the Pacific Coast, "All Hands." I agree with them as, "No man can serve two masters." Think I used that once before in a letter printed in the September number.

Too Much Mixing

I honestly believe they make one mistake, i. e., in the employment office or, rather the idea of any ship's officer going to a general employment office with the crew, longshore-

men, etc. They should have a place or room by themselves to go to, as if any officer mixes with the crew, longshoremen, etc., how can he at the same time keep discipline on shipboard? A case I know of—and every deck and engineer officer knows of thousands of them: Mr. First Mate or Mr. First Assistant Engineer goes ashore with John Fireman, John Seaman, etc., for the evening. They take in a movie, have a couple of drinks. Next day or shortly after John is told by Mr. Mate or Mr. Engineer to get a move on and do something. He has his feelings badly hurt and expects you to take your hat off to him and say please, etc. No, the two don't go together, as you cannot mix the officers and crew and have discipline at the same time.

The conditions are the best in the world and I know it; have even known Englishmen and Germans admit it, and I think that there are improvements that can still be made that will save money and cost less than some we have now. We now have a few laws that are a long way from being any improvement.

Americanizing European Staff

To change the subject, I am glad to know that Mr. Joseph E. Sheedy will cause an Americanization of the European U. S. S. B. staff. (Would not mind one of those jobs myself.) In the first place, when a U. S. S. B. ship makes port, here comes a gentleman and inquires of the draft, fuel used, repairs (and if you have no repairs to be done by a shore gang they get sore and say you cannot do it yourself). He will be gone only a short time and here comes a line of them all asking the same questions or nearly so. The government pays them a nice wage and they don't earn it. Most of them will arrive just in time to ask themselves to a square meal and then kick because you don't have "plum duff" and a few more things. One man even came daily for three days and enjoyed two meals per day at the ship's expense. So I am glad Americans will manage to receive those nice fat plums (I think I'll ask for one myself). Hope I get it so I can show my wife and family some part of Europe.

In regards to the ship's crew doing their own repair work, I don't see any reason why they cannot do

all of it except a very few jobs that may cause a delay in the ship's movements if it is too large for the ship's force to do. It seems that some men are afraid to take anything down for fear that they cannot put it together again without making what is called a bull—not

able to put the bearing together again with the .008 or .010 clearance it should have.

First's Dream

Here is what I want some day. I want the chief's job on the largest ship in the world and have it flying the American flag; also whereas any

man going to sea should look at his ship as his home, keep it clean, etc.; also would like to see the day when my wife and baby girl can make a trip with me once in a while.

Whereas it is now time to turn in and pound my starboard ear, I am,

Yours truly, FIRST ASST.

HIGH OPERATING COSTS

The Chief Comes Back for More

THERE is no disputing the fact that it costs more per ton mile to carry freight in an American steamer than it does in the foreign vessel. This should not be, but it is so, and until present conditions are changed the commercial success of our shipping will be nothing or less.

Patriotism is a splendid thing. It is fine to say that one American can do so much more than two or three foreigners. As a matter of fact, the average crew of American ships is much less efficient than that of foreigners. It takes more men to run an American ship than it does the other sort, so naturally it costs more. Besides the great difference in wages, the American seaman is more costly to feed. This, with his wasteful ways, augments shipping charges materially.

The writer has before touched upon the extravagance of building American vessels with their many unappreciated luxuries provided the members of the crew. He here points out a few of the most sapient reasons for high operating costs.

First, the LaFollette Seamen's Act, while admirable in its intentions, will never work with the average deep water crew. This law should be absolutely repealed, and a completely new one put on the statutes. The evils of the present law have been so often detailed that a repetition would be wearying. However, one of the most glaring defects is its giving the seaman the right to demand half of accrued wages at every port. The writer knows personally of two vessels he has been on where a full day's loss of the ship's time was caused by part of the crew being absent, drunk, when the ship was ready to sail. Then having to pay full wages to men who have incapacitated themselves by reason of their own foolishness does not appear to be good business. Under the present law it has to be done.

The writer can see no reason why a ship cannot be operated much as a machine shop or other factory is,

Pay for the time worked and no more. There will be little or no trouble at sea. The misery and loss of time are in port. If all hands knew their pay stopped when they were not on the job, fewer of them would be A. W. O. L. in foreign ports and ships would be less delayed.

It is also believed much waste could be prevented by instituting some sort of a method by which all food should be paid for by the seaman as he eats it. This it is sure would prevent much waste. It would not be difficult to have coupon books issued good for different amounts, these books to be charged to the seaman, who would pay in coupons as he desired. Something along the lines of the Panama Canal commissary could easily be worked out and would prevent great waste. It is known that anything given free is not appreciated, and this fact is very noticeable on American ships as regards bedding, towels, food, water, light, etc.

Another Method

The average American does not submit to discipline gracefully, unless that discipline is enforced by military methods. One way the writer believes might be taken advantage of, and that would be to make the merchant marine an auxiliary navy only so far as the crew goes. Let the operator or owner of the vessel pay to the Navy Department a fixed amount for crew service, the crews to be under naval regulations but the operation of the vessel entirely under the orders of the owners in so far as her voyages, loading, etc., were concerned. By this method an efficient Naval Reserve would be built up, and discipline could and would be maintained. It would also insure all American crews. Let the same regulations as regards liberty, service, promotions, etc., obtain as in the regular navy, the crew to feel they are a part of that navy and not of "Hooligan's Navy," as the U. S. S. B. men were derisively called.

An Evil in Foreign Ports

As the Shipping Board rules stand

now, anyone shipped in a foreign port receives the standard American pay, no matter what the rate is at the place shipped from. For instance, some member of the crew is paid off in Para. Brazil. His successor is signed on at, say, oiler's wages, \$80 gold per month; yet the wages for oilers out of that port are but \$25. This is not right, yet the argument put up by labor leaders and molluscoids is that if the crew could be "run out" by cruel ship's officers and all new ones signed on at the lower figure, it would result in a hardship to the seafarers. This is a fallacy. An experience covering fifty years has shown the writer that no good man is ever run out. His services are in demand.

It is believed possible to have it so arranged that any seaman can enter or leave any maritime port in the world without immigration restrictions. This would make it so that changes of crew could be made with little or no trouble, the bad ones gotten rid of and given bad records, that they be not hired again except in most urgent cases.

However, the subject is a complex and difficult one and should be taken in hand by a committee appointed by the President of the United States. This committee should be empowered to seek information bearing on the matter and to formulate some good sensible seamen's laws, and then Congress should enact them.

The present laws were evidently designed with the idea that seafaring men were not endowed with common sense. As an American consul in a South American port told the writer, "Seamen are evidently not human beings, as the United States shipping laws would seem to indicate." At that, the consul was in a measure right, for regrettable as it is to say it, a more despicable, low, drunken, depraved lot of men than the majority of the men of the American merchant marine it would be hard to find. And this also goes for many of the officers. The writer knows a howl of anger will go up,

if this ever reaches print, but the truth of it can be proven by referring to our consular records in foreign ports.

So, after all, perhaps the best solution is to man our ships with naval men. For one thing, they would be under discipline, and the officers for the most part would be efficient and skilled in handling men and enforcing regulations in a dignified manner. That some change is needed is evident, and men of experience in the practical handling of ships at sea, both on deck and in the engine rooms as well as commissary departments, should be chosen to formulate just, equitable and proper laws, fair alike to the owner and to the crews, and for the public good.

"But a man can't keep a family on ninety dollars a month," remarked an oiler to the writer a few months ago on a steamer, of which the latter was chief engineer.

This remark made some figuring necessary. While in no way desiring to belittle the worth of an oiler, can rightly class that sort of labor with that of a helper for a marine machinist. The result is this: at wartime wages a helper received \$4.80 per day. His average days'

labor per month was 24. This made a total of \$115.20. Out of this he had to keep his home, if he had one, or pay his board; had in most cases to pay not less than 10 cents a day transportation; also in most of the yards 15 cents a week hospital dues. This left him, allowing only \$40 for room and board, \$72.20.

The oiler has his board and room; transportation and hospital dues nil. So it seems at even \$80 per month the oiler has the best of it.

Now take the assistant engineers: first assistant \$200, second \$165, and third \$145; average \$170 per month. Compare this with shop wages: leading hand \$7.20 per day; marine machinist \$6.40 per day; foreman \$200 per month; average \$178.80 per month. In this, too, the assistant engineers have an advantage.

So the great cry that "a seafaring man cannot keep a family" is not based on facts. True, there are disadvantages in following the sea, but money earning power is not one of them. Money wasting power is the factor to be considered.

A recent steamer on which the writer was employed had the usual sixteen men besides the chief in the engine department. Less than 9 percent of these saved any money dur-

ing a voyage of nearly six months. Five of them did have allotments. Of these, only two saved any of what was due them after allotments were paid. The balance, under the wise (or unwise) provisions of the Seaman's Law, drew one-half of such amounts as were due them at every port and arrived back in the United States with little to show for the voyage except an assortment of physical diseases and experience.

With a desire to help these folks, the chief gave them all possible good counsel regarding the evils of intemperance, wastefulness, etc., but it did little or no good, so the conclusion is arrived at that the less pay a certain class receives the better it is for them.

And this leads up to another suggestion. Could not some system be devised by which steady service would be rewarded; where the man who was sober and saving would receive a higher rate next voyage, and the drunk and waster left in his rut? This, it is believed, might help to solve the "turnover" and tend to the betterment of those deserving. This, with a system of proper marking of "ability and conduct" sheets, should do much toward clearing up the difficulty. SEA FLAME.



A GREAT AMERICAN LEGAL NAVIGATOR

(Continued from page 717)

In 1895 he compiled the Navigation Laws, since issued quadrennially, designed primarily for the convenience of the officers and owners of American vessels. He has also contributed articles on maritime subjects to popular and scientific publications here and abroad.

He was born in Albany, New York, September 28, 1856, the son of General Frank Chamberlain and Celia Deborah Tyler. His ancestors on either side served in the wars of the Republic from the Revolution. He was educated at the Albany Academy and at Harvard College, graduating with honors in metaphysics in 1878. After teaching school one year and employment in the transportation and grain elevator business for two years, he entered newspaper work as legislative

correspondent for the Associated Press for some years and as associate editor of the Albany Evening Journal and then editor of the Albany Argus until 1893, when he came to Washington as Commissioner of Navigation, from which position he resigned in August, 1921, to enter the Bureau of Foreign and Domestic Commerce. He married April 17, 1900, Mary Lee, daughter of Captain Dudley Portieux Barnette, aide under Stonewall Jackson. Mrs. Chamberlain died August 29, 1904. He is a communicant at St. Patrick's Church, Washington, a member of the Military Order of the Loyal Legion and of various organizations. President Millerand of France awarded him recently the cross of Chevalier of the Legion of Honor for special educational work among French war orphans for several years.

FULL SPEED AHEAD

EDITED BY ANDREW FARRELL

Steamship Operations

Oceanic Plans Vessels

In the event that a satisfactory arrangement is made with the United States government for the continuance of the Oceanic Steamship Company's Australian mail service, the company is prepared to build two vessels. During a season of rapidly dwindling construction, when new contracts are most rare, this is eminently important news. Just what the company seeks of the government has not been disclosed, but it is well known that the present contract, executed under the Ocean Mail Act of 1891, is thoroughly unsatisfactory and not likely to be renewed. In this attitude the Oceanic Line follows the lead of the American Line, which declined to consider any renewal of its Atlantic contract last year, although Postmaster General Burleson retorted in kind by saying that he lacked authority to act even though the company were willing.

Mr. Burleson Is Gone

But happily Mr. Burleson is gone from the seats of the mighty. Perhaps Postmaster General Hayes and the Shipping Board will be more amenable to the pressure of facts. In their hands lies the future of American shipping so far as mail contract lines are concerned, for the Merchant Marine Act provides that they may act jointly in executing new agreements, although the Ocean Mail Act and its limited subventions are not specifically abrogated. In fact, they are, however, by the refusal of the American and Oceanic lines to consider renewing contracts under their provisions.

In any discussion of mail contracts the word "subsidy" is likely to confuse the issue. For a long time the American people, or at least their representatives in Congress, have been opposed to any general ship subsidy, even though a protective tariff has been a conspicuous feature of our national policy for more than fifty years. To speak of subsidy, therefore, is to endanger the whole scheme of contract mail services; and certainly the history of the Oceanic Line's Australian service does not permit the accurate use of that word. "A subsidy may

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be a simple gift," says the dictionary, "or may consist in the payment of an amount in excess of the usual charges for any service." Now the ocean mail services, established and maintained under the Act of 1891, have not received any "simple gifts," and in fact have been paid less, in some instances, than other steamship companies received for transporting the mails.

Many Failures Recorded

With the passing of the American Line's trans-Atlantic service, the Oceanic remains the most conspicuous of the "subsidized" companies. Its history is longer than that of any other company engaged in the American-Australian trade, for the last fifty years are full of repeated failures. In 1870 the American-Australian Steamship Line, operating under the British flag, established the first San Francisco-Sydney service on behalf of the New South Wales and New Zealand governments. It operated for only one year. Webb's & Holliday followed in 1871 with four wooden paddle-wheel vessels, all of American registry, and managed to survive until 1873. Promptly on their heels, the third service, that of the American Steam Navigation Company, was established in 1874 under the British flag; it died in the same year, although subsidized by the governments of Australia and New Zealand. Next came the service of the Pacific Mail Steamship Company, American, and the Fairfield Shipping Company, British, which operated jointly from 1875 to 1885, when the Pacific Mail withdrew and the Fairfield company sold its vessels.

The fifth line was established jointly by the Oceanic Steamship Company, American, and the Union Steamship Company of New Zealand, British, in 1885. Two steamships, Alameda and Mariposa, were oper-

ated by the Oceanic Line until 1900, when the Union company dropped out and the Oceanic constructed the Sierra, Sonoma and Ventura, and remained in the trade until 1907, when as a result of the San Francisco earthquake and fire it was compelled to withdraw; but in 1912 a new contract was negotiated with the government and the Ventura and Sonoma, both of which were reconditioned and converted to oil-burners, returned to the service.

Less Than Pound Rates

The Oceanic Line is receiving from the government approximately \$187,000 a year for transporting outward mails and about \$12,000 for carrying inward mails from Pago-pago, American Samoa, and Honolulu. What service has been given in return is evidenced by the report of the postmaster general for the fiscal year ending June 30, 1919, which says in part: "The cost of the service on route No. 80, San Francisco-Sydney, was \$177,058.84 less than the conveyance of the mails concerned would have cost if the steamers had been paid at the rates applicable to non-contract steamers. . . ."

This mail "subsidy" may be profitably compared with those received by some other companies. The Commonwealth of Australia pays to the Orient Line £130,000 for a four-weekly service between Australia and the United Kingdom. Should the company increase its sailings to fortnightly it would receive £170,000 a year. The Peninsular & Oriental Line receives the same amount from the British government, and both lines transport inward and outward mails.

Some Other "Subsidies"

For the Vancouver-Suva-Auckland-Sydney monthly service of the Canadian-Australasian Line (Union Steamship Company of New Zealand) the New Zealand government pays £20,000 a year, Fiji £5000 and Canada £37,000; and the company's vessels, moreover, often transport United States and Australian mails at pound rates. The Union Steamship Company also maintains a San Francisco-Tahiti-Wellington route with monthly sailings, for which it receives £25,000 a year from the New Zealand government and 200,000 francs for eighteen months from Ta-

hiti; and poundage also is paid by Australia and the United States, each nation being responsible for the transportation of its outward mails.

The Japanese government appropriated yen 7,269,300 for its subsidized steamship lines during the fiscal year April, 1921, to March, 1922. Most of the companies are subsidized in the true sense of the word; the largest of all, the Nippon Yusen Kaisha, is not, as it requested that its subsidy be changed to a direct mail payment. This was done, at a saving of yen 700,000 to the Japanese government; nevertheless, the N. Y. K. will be paid yen 1,450,000 for the transportation of mails in the Seattle, Melbourne and Antwerp trades; the T. K. K. will receive yen 1,164,137 for operating three vessels between San Francisco and the Orient; and other lines will get smaller amounts.

The Oceanic Company's contract with the government under the Ocean Mail Act expires in June, 1922. It is to be hoped that the postmaster general and the Shipping Board will make it possible for the company to continue the service.

Fruit Exchange Plans Refrigerator Line

Decidedly the most interesting news of the month comes from Los Angeles in the form of an announcement that the California Fruit Growers' Exchange is working on plans for the establishment of an intercoastal refrigerator service. Almost coincident with this is the entry of the North Atlantic & Western in the coast-to-coast trade with six refrigerator vessels, which make the long-awaited service an actuality.

Since the revival of the intercoastal shipping early in 1920 there has been discussion of a refrigerator line, the principal function of which would be to transport Pacific Coast fresh fruits to the Atlantic market. When railroad rates were increased in August, 1920, discussion naturally waxed greatly; but in spite of the large quantities of freight that appeared to be in prospect no private steamship line decided to enter refrigerator vessels. That there were good reasons why operators should decide against such a service was made evident in Pacific Marine Review for July and October. These reasons will be outlined later.

Seventy-eight Cents a Box

After making an exhaustive study of water transportation of citrus fruits, the water transportation committee of the California Fruit Growers' Exchange, under the chairman-

ship of C. S. Whitcomb, recommended as follows to the board of directors:

"That it is to the best interests of the exchange that an independent steamship company be organized and financed in Southern California, having as its first object the transportation of citrus fruits from San Pedro to Atlantic ports"; and:

"In order to lay a foundation on which to finance the steamship company, we further recommend that the management be authorized to take the necessary steps with its citrus shippers to contract as much as 2,000,000 boxes (about 5000 cars) per year, for a term of three years, of citrus fruits for transportation by water from San Pedro to Philadelphia, New York and Boston, in ships equipped with cold-air refrigeration system, especially for fruits, and at a freight rate to be fixed on a sliding scale for the term of the contract, the freight rate the first year not to exceed 78 cents per box from the dock at San Pedro to the dock at Philadelphia, New York and Boston, with a reasonable additional rate for transporting the fruit from the packing houses to San Pedro and pre-cooling the fruit at San Pedro."

Rates Are Compared

The water transportation committee compares its proposed rate of 78 cents with existing rates as follows: "Our present transportation charges on this fruit are: freight, \$1.92 per cwt., plus average icing charges, 12 cents, equals \$2.04 per cwt. (Credit 2,000,000 boxes by steamship under refrigeration with \$2.04 per cwt., equals \$3,182,400. This amount of money would pay the entire operating expenses of the steamship line if it went east with citrus fruit only, which would be only two-thirds of a cargo, and came back empty; therefore, you (members of the exchange) are now paying the bill. At this particular time, owing to the abnormal conditions surrounding business and shipping, we are offered the opportunity to do with \$2,000,000 what would require under normal conditions at least \$6,000,000 to accomplish." The present water rates are \$1.05 for lemons and \$1.15 for oranges, etc., the fruit being ventilated but not refrigerated. Relatively little has moved in intercoastal steamships, as may be seen from a summary that appears at the end of this article.

An investigation made in the East, the water transportation committee reported, indicated that "the oldest and strongest steamship companies are dominated by railroad influence

through capital sources and will not compete" and that companies not so dominated were operating Shipping Board vessels and lacked necessary capital. Both of these statements appear to be ill-considered: by their very presence in the intercoastal trade the steamship companies discredit the first assertion; and, in order to undermine the second, it is necessary only to point out that but one company is operating Shipping Board tonnage. At any rate, the exchange turned to the Shipping Board, which agreed, the committee reported, to install cold-air refrigeration in about two-thirds of the space of each of six vessels and to charter the craft to the exchange on the bareboat form for five years with option of purchase. (The exchange carried on negotiations during the summer with the American Shipbuilding Company for ten 3800-ton steamships, but these vessels were not large and fast enough and nothing was done toward consummating a deal.) The vessels desired of the Shipping Board are 7500-tonners and would have capacities, in two-thirds of their holds, for maximum cargoes of about 74,000 boxes, although the committee estimated that average cargoes would be 60,000 boxes from January to October inclusive, so that space for 3000 tons of other cargo would be available. On westbound voyages, said the committee, general cargo could be carried, for "there is plenty of this cargo for all the ships now operating."

Westbound Cargo Scarce

The latter statement will bear investigation. As a matter of fact, the exchange cannot count too surely on westbound general cargo. During the month of September 25 vessels in the intercoastal trade carried 72,620 long tons of cargo from the Atlantic to the Pacific, an average of less than 3000 tons to the ship. This is by no means near capacity, for the average gross tonnage of the 25 steamships was 6681 and the net 4418, these being roughly equivalent to a deadweight of 10,000. An added trouble is that care must be exercised in loading refrigerated vessels, lest the insulation be damaged; and the necessity of choosing freight would reduce the amount obtainable.

To operate these vessels, the exchange proposes to organize a Producers' Steamship Company of California, capitalized at \$5,000,000, of which between \$1,000,000 and \$2,000,000 would be offered for sale, the remaining stock to be held in the treasury and offered to exchange shippers at the end of the third year. Should the company be or-

ganized, the committee continued, Prentiss N. Gray of New York, well known as the founder of P. N. Gray & Company, shippers and grain exporters, agreed to take a substantial block of stock and to operate the vessels on a percentage basis.

The steamship company would handle fruit as the railroads do now; that is, dispatch trucks to packing houses, transport the fruit to San Pedro (Los Angeles Harbor), pre-cool it and hold it cool in storage until it should be unloaded at Atlantic ports. This system would require a fleet of trucks and a pre-cooling plant at San Pedro capable of taking about 200 cars of fruit. A dock could be obtained in New York near the Auction Market, the committee ascertained; in Boston the Commonwealth and Quincy Market Cold Storage & Warehouse Company docks could be had; and in Philadelphia a municipal dock was found to be available.

Objections Are Answered

Objections raised by different steamship operators to the practicability of an intercoastal refrigerator line may be summarized as follows: Refrigerated freight, being perishable, demands an immediate market; accordingly, many railroad cars are consigned to some such city as Omaha or Council Bluffs and on arrival reconsigned to whatever city offered the best prospect of sale, with the result that large quantities of fruit are not cast on any one city; a refrigerator steamship, on the other hand, would have to discharge at one or at most two ports and thus probably create a glut, especially since adequate storage facilities could not be obtained. Nor would reshipping from Atlantic tidewater to interior cities answer, because of the increased expense over direct rail transportation. Some of these objections are anticipated by the exchange's plan to ship only 2,000,000 boxes to New York, Boston and Philadelphia, or about one-half of the fruit now sold in those markets and only 10 per cent of total shipments of the year, which means of course that the railroads would continue to do a large business. A more detailed analysis of the attitude outlined above will be found in the following statement, prepared by C. S. Whitcomb, chairman of the water transportation committee, at the request of Pacific Marine Review:

"The California Fruit Growers' Exchange sold in the three auction markets of Philadelphia, New York and Boston during the fiscal year 1920-1921 over 11,000 cars of citrus fruit. One-half of this amount, or

about 6000 cars, were direct shipments to the three auction markets, and the remainder were diverted cars from interior points. The railroad companies are giving fairly good service to this traffic now, and the direct shipment cars arrive at their destination in twelve to thirteen days; the diverted cars in from thirteen to fifteen days. However, during the years 1918 and 1919 the average time varied from eighteen to thirty days, and the refrigeration under these conditions was very uncertain and variable.

"Refrigeration by steamship would be maintained uniformly at any temperature desired, and humidity and ventilation would also be regulated. A good steamship will make the run from San Pedro to New York in fifteen to sixteen days. Therefore, we expect to land our fruit by steamship under refrigeration in better condition than the average condition of our rail shipments at that point.

Glut Is Not Feared

"As to the quantity of fruit that would be landed in these markets in one cargo, we are assuming average cargoes of about 60,000 boxes, to be divided proportionately between two ports, either New York and Philadelphia, or New York and Boston. When I tell you that we frequently sell 25,000 to 30,000 boxes on New York auction in one day, and have sold as high as 40,000 boxes in a day, you will see that the average cargo would not supply the two markets more than two days, and that the maximum cargo during the peak of the season would not constitute more than three days' supply. During the past summer there was sold in New York auction, on several occasions, over 300 carloads of California fruits in one day. It is neither logical nor efficient that all of this fruit should be transported across the continent by rail at an excessive transportation charge, when it can go by steamship under excellent refrigeration and, in about four days' additional time, land in the market in better condition and at about half the transportation expense.

"As to the question of storage facilities, that does not interest us as applied to our product, for the reason, as stated, that our maximum cargo would not be more than three days' supply for the markets to which consigned, and would be sold about as rapidly as it could be discharged from the ship. Therefore, there would be no necessity for storing any portion of the shipment.

Not an Experiment

"Water transportation under proper refrigeration is not an experi-

ment. The United Fruit Company have been in the business for years, transporting both bananas and oranges, and oranges are being brought up to England from South Africa by refrigerated ships through the tropics, after having made a 1700-mile rail journey to the coast. When we shipped out of California during the past year (November 1, 1920, to October 31, 1921) over 150,000 cars of perishable food products—deciduous fruits, citrus fruits, melons and vegetables, about 20 per cent of these shipments went to the Atlantic seaboard for consumption in the large cities, where consuming population is densest. It is a transportation axiom that 'the tonnage will follow the service.' With over two million tons of these products to draw from, about 20 per cent of which go to the Atlantic seaboard, it seems quite certain that the steamship company that first establishes a regular, frequent and dependable refrigerated service from coast to coast, will get its proportion of this tonnage.

"As to the stage of our enterprise, I would say that ours is a large organization. There are 200 shipping organizations connected with it, and all details must be worked out with each one of these organizations, all of which consumes a great deal of time. However, we are steadily making progress, and our people have definitely made up their minds to carry out this shipping enterprise."

Nawasco Service

The North Atlantic & Western service will be maintained with the steamers *Dochra*, *Deerfield*, *Neponset*, *West Catance* and two unnamed vessels, all of which, except the *Dochra*, can take full refrigerated cargoes. The *Dochra* is partially insulated. This service was inaugurated by the Elder Steel Steamship Company with two steamships in November, but was taken over almost immediately by the North Atlantic & Western, which is represented on the Pacific Coast by the Pacific Steamship Company, and the two and perhaps three vessels of the Elder Steel Line were increased to six.

During the eight months of 1921 ending August 31, declared shipments of fresh fruits through the Panama Canal aggregated 7132 tons, of which 5927 tons was from the Pacific Coast of the United States, 1193 from Australia and New Zealand, 10 from the West Coast of South America and 2 from the West Coast of Central America. All the Australasian fruit and 149 tons from the Pacific Coast of the United States, an aggregate of 1342 tons,

went to the United Kingdom; 1023 tons from the Pacific Coast went to other countries of Western Europe and 4745 tons to the Atlantic Coast of the United States. In terms of boxes the fruit movement was 213,960, of which 177,810 boxes was from the Pacific Coast.

American vs. Foreign Shipping

The accompanying tables, prepared by the statistical department of the Shipping Board and published in Commerce Reports, tell the story of a marked decline in that portion of our foreign trade transported by vessels of United States registry. Somewhat singularly, the greater relative loss has been recorded in imports, although it is a maxim of shipping that a nation may be expected to carry more of its imports than of its exports, inasmuch as the consignee is usually credited with the power and the desire to direct that his goods be transported in his own country's vessels.

That this belief may have to be

subjected to considerable revision is apparent to anyone who studies the tables. The aggregate tonnage of imports moved in American bottoms declined from 64 per cent of the total in July, 1920, to 44 in August, 1921, and in the same time foreign lines gained 20 per cent, from 36 to 56; in other words, practically the whole loss of 600,000 tons in the volume of imports fell on American shipping, while foreign lines did as much business in terms of long tons in August as they did in July, 1920.

Board Business to Foreigners

An immediate cause of the falling off in tonnage handled by American vessels is to be found in the tying-up of Shipping Board bottoms, which had attained considerable magnitude by October, 1920. In July of that year there was practical equality between foreign, American private and Shipping Board vessels as regards percentage of import business, although the foreign lines were handling 36 per cent as against the 32 per cent of each of the others. Sta-

tistics of succeeding months tell an almost unbroken story of defeat, despite a temporary gain made by American private vessels in November and December, 1920. The result is that independent American lines did 33 per cent of our aggregate import business in August, 1921, as against 32 per cent in July, 1920, while the foreigners had gained 20 per cent and the Shipping Board had lost 21 per cent. The Shipping Board's proportion of trade has not gone to other American vessels, as one might expect; it has not even been divided more or less equally between the American independents and the foreigners; it has gone wholly to the latter.

If these facts prove any conclusion at all they prove that American importers are not supporting their own merchant marine.

Opposite Tendency of Exports

It is at least striking, however, to discover that diametrically the opposite tendency has been manifested in our export trade, which is much

United States imports carried by American and foreign ships
July, 1920-August, 1921 (excluding oil).

Months.	Foreign.		United States, independent.		United States, Shipping Board.		Total in long tons.
	Long tons.	Per cent.	Long tons.	Per cent.	Long tons.	Per cent.	
1920.							
July.....	508,008	36	531,382	32	546,787	32	1,586,177
August.....	770,288	40	571,804	33	482,676	27	1,824,768
September.....	723,999	42	530,286	31	454,435	27	1,708,720
October.....	1,062,536	61	802,656	36	138,175	16	1,999,367
November.....	580,691	42	802,656	43	363,690	17	1,746,937
December.....	701,821	54	1,071,912	52	298,440	14	2,072,173
1921.							
January.....	641,671	59	797,245	31	776,800	14	1,915,716
February.....	746,061	46	535,560	34	1,006,720	21	1,888,341
March.....	655,236	42	597,712	38	307,106	20	1,560,054
April.....	770,184	49	548,967	36	278,596	17	1,597,747
May.....	617,356	48	516,362	34	190,713	14	1,304,431
June.....	544,765	42	364,435	36	127,201	12	1,036,401
July.....	547,700	42	367,368	36	118,978	10	1,034,046
August.....	606,166	56	363,530	33	118,978	11	1,088,674
Total.....	9,842,446	45	7,847,530	36	4,028,789	19	21,718,765

United States oil imports carried by American and foreign tankers, July, 1920-August, 1921.

Months.	Foreign.		United States, independent.		United States, Shipping Board.		Total in long tons.
	Long tons.	Per cent.	Long tons.	Per cent.	Long tons.	Per cent.	
1920.							
July.....	37,392	4	623,323	61	351,552	35	1,012,267
August.....	114,276	8	863,857	63	448,977	32	1,427,110
September.....	110,855	8	805,814	62	434,960	30	1,351,629
October.....	128,778	9	919,177	61	448,962	30	1,496,917
November.....	188,666	11	1,057,617	59	467,967	24	1,614,250
December.....	172,324	10	1,068,550	62	470,338	28	1,711,212
1921.							
January.....	155,308	9	1,047,345	64	436,077	27	1,638,730
February.....	183,837	8	1,081,857	63	460,355	29	1,726,049
March.....	140,711	9	1,000,234	63	319,977	23	1,460,922
April.....	166,460	7	1,008,747	78	382,669	18	1,557,876
May.....	200,265	15	944,975	72	136,432	12	1,281,712
June.....	246,479	19	900,622	71	126,077	10	1,273,178
July.....	167,281	12	657,636	74	115,470	14	940,387
August.....	96,320	20	330,770	71	66,362	9	493,452
Total.....	1,936,526	10	12,544,877	66	4,533,225	24	18,914,628

United States exports carried by American and foreign ships
July, 1920-August, 1921 (excluding oil).

Months.	Foreign.		United States, independent.		United States, Shipping Board.		Total in long tons.
	Long tons.	Per cent.	Long tons.	Per cent.	Long tons.	Per cent.	
1920.							
July.....	2,563,390	54	784,449	17	1,114,795	25	4,462,634
August.....	3,265,996	59	1,043,779	19	1,212,963	22	5,522,738
September.....	3,419,800	61	809,437	14	1,286,927	22	5,516,164
October.....	4,702,063	65	1,109,394	15	1,171,477	16	6,982,934
November.....	2,969,481	56	1,067,506	20	1,154,724	22	5,191,711
December.....	3,244,243	60	855,478	17	1,343,797	17	5,443,518
1921.							
January.....	2,607,714	67	567,411	15	1,591,888	17	4,767,013
February.....	1,672,521	64	508,328	18	347,116	18	2,917,965
March.....	1,819,800	60	469,800	20	3,074,201	30	5,363,801
April.....	1,944,790	60	614,217	19	894,402	21	3,253,409
May.....	2,627,124	60	614,217	19	299,675	15	3,540,016
June.....	2,627,538	52	1,115,062	21	1,090,660	22	4,833,260
July.....	2,665,929	60	1,112,944	21	671,963	15	4,450,836
August.....	2,412,245	59	1,777,084	29	524,534	19	4,713,863
Total.....	28,719,719	61	12,535,117	29	12,640,650	19	53,905,586

United States oil exports carried by American and foreign tankers, July, 1920-August, 1921.

Months.	Foreign.		United States, independent.		United States, Shipping Board.		Total in long tons.
	Long tons.	Per cent.	Long tons.	Per cent.	Long tons.	Per cent.	
1920.							
July.....	161,375	53	102,345	33	42,811	14	306,531
August.....	171,244	49	129,851	37	97,714	28	398,809
September.....	165,804	53	119,290	31	57,482	17	342,576
October.....	242,402	55	128,150	28	79,792	17	440,344
November.....	152,645	54	102,345	33	67,283	14	322,273
December.....	226,918	65	147,602	31	66,003	11	440,523
1921.							
January.....	221,254	58	196,933	35	37,690	7	455,877
February.....	283,269	60	123,009	26	66,275	14	472,553
March.....	272,469	49	196,005	36	98,945	13	567,420
April.....	156,864	53	119,290	31	46,431	10	322,585
May.....	309,256	72	181,531	23	.....	.....	490,787
June.....	239,174	60	153,129	31	29,663	5	421,966
July.....	209,707	53	133,129	29	11,819	5	354,655
August.....	234,101	73	112,303	27	17,536	4	363,940
Total.....	2,502,662	58	1,902,831	32	635,367	10	5,040,860

more important to the operator because of its greater tonnage and because the decline in volume during the fourteen months under survey was only 270,000 tons as against 600,000 of imports. In exports the American independents have been able to gain the entire percentage lost by the Shipping Board, whereas the foreigners are in practically the same percentage status as they were in July, 1920. As regards tonnage, indeed, our private operators have gained 500,000 tons and foreigners have lost 175,000; but it should be added that the American gain first became apparent in June, probably coincident with the revival of trade, and that much of our recent success may be due therefore to the ability of American operators to take immediate advantage of increased exports. Nevertheless, in spite of our gain, the tables record that foreign vessels carried 57 per cent of our exports in August, while American independents had only 30 per cent and the Shipping Board 13. Even if private American operators actually are gaining on their foreign competitors, even if they should make permanent their increased tonnage of June, July and August, they have, it must be confessed, a long way to go before they can lay claim to any practical equality.

For the entire period of fourteen months, foreign steamships transported 45 per cent of our imports and 61 per cent of our exports, as compared with 36 per cent of imports and 20 per cent of exports carried by private American bottoms and 19 per cent of both imports and exports handled by the Shipping Board.

Regarding Fuel Oil

Not so much importance may be attached to the tables of imports and exports of oil, because the transportation of oil is largely in the hands of producers and does not concern the general carrier. Yet it is interesting to note that foreign tankers have been making some appreciable gains in percentage, although their share of the import oil trade remains small in comparison with that of the American independents. The Shipping Board's volume sank from 35 per cent in July, 1920, to 9 per cent in August. On the export side of the account, foreign tankers have decidedly the best of the battle, but their position is not nearly so strong as that of American independent operators in the import trade. Of the total import and

export tonnage of oil of the fourteen months, foreign vessels carried 5,519,218 tons, American independent 14,337,688, and Shipping Board 5,188,492; while in the general cargo trade during the same period foreign vessels handled 47,701,165 tons, American independent 20,182,696 and Shipping Board 16,072,439.

While the American operators are handling less than half of American foreign trade, imports and exports both included, foreign lines are not only defeating us on our own ground but also are engaging in fifty services unknown to our vessels. Except for a few around-the-world routes, some of which have had only doubtful success, American vessels do not engage in trade between foreign ports. Our entire shipping structure is based on our own import and export trade; while British vessels are competing with American in the New York-River Plate service and with Japanese between Liverpool and Yokohama, or with French between the Pacific Coast and the Channel. Whatever the remedy (and there will be as many proposed as there are observers), there is no disguising the fact that the situation is serious.

A Voice from Canada

That Canada on her own behalf, and without any particular eye to the interests of the British Empire, opposes free passage for American coastwise shipping using the Panama Canal was stated in these columns a few months ago. The argument repeated then was that Canadian intercoastal shipping would be placed at a decided disadvantage as compared with American; now comes the Canadian Railway and Marine World with still another criticism:

"Should the bill (now pending before Congress) in its present form become law, it would be possible to ship freight intended for Europe, by U. S. ships, from any Canadian or U. S. port on the Pacific Coast, to any U. S. port on the Atlantic, where it could be transhipped to other ships crossing the Atlantic; and again goods could be shipped at any Canadian or U. S. port on the Atlantic Coast to any U. S. port on the Pacific Coast, for transshipment across the Pacific; in both cases, without paying Panama Canal tolls, while British or Canadian ships, passing from coast to coast, or direct through the Panama Canal, to the Orient, or Australasia, would be discriminated against to that extent.

"The argument used in the U. S. Senate, that U. S. money built the canal, and therefore U. S. ships should receive the benefit, does not hold, when the full history of the project is considered. At the time of the signing of the Clayton-Bulwer Treaty, the rights of Great Britain and the U. S. in the matter were, at least, equal, and the condition imposed on the U. S., under the Hay-Pauncefote Treaty in 1901, viz., the use of the canal by all ships of all nations observing the rules, on terms of entire equality, was the consideration for which Great Britain transferred her rights to the U. S. Any discrimination in favor of U. S. ships would therefore be a gross break of the treaty's provisions and an act of national dishonesty."

It Is Far-fetched

This argument appears to be rather far-fetched, inasmuch as a saving of \$1.20 a net ton, registered tonnage, hardly would pay the cost of discharging and reloading cargo. Even if it should cover these expenses, there is little reason to believe that transfer of freight at an Atlantic port would be any more successful in competition with direct lines than was the similar plan governing Atlantic-Orient freight that was put into effect on the Pacific Coast last year. That arrangement failed to produce much cargo and scarcely is heard of today.

Such arguments as these serve the purpose of befuddling the issue, but they accomplish little else. Evidently the actual question of tolls remission hinges upon the Clayton-Bulwer and Hays-Pauncefote treaties, regarding which highly competent opinion is hopelessly divided. Extraneous issues should not be dragged in. If they must be, then something surely is to be said regarding the canal's cost and its failure to pay any return whatever on America's investment of \$368,543,272.

No "Profit" Made

The canal administration plumes itself, and justly, upon the fact that for four consecutive years the canal has earned an "excess of revenues over expenses of operation and maintenance;" but this language is quite precise and omits, it should be observed, any mention of "profit." Despite an excess of \$2,711,918 during the fiscal year ending June 30, 1921, the actual excess for the entire period of operation was only \$420,000, due to deficits incurred in removing slides from the Gaillard

Cut. What if such items as interest, sinking fund, depreciation and others were to be included? How would the account stand?

If the United States intends to keep tolls at a level insufficient to pay the cost of the canal, if, in other words, Panama is to be maintained by the nation as an unprofitable commercial and naval waterway between the Atlantic and Pacific for the benefit of the world at large as well as of our own navy and shipping, then, it appears, foreign nations have little ground for complaint, even if tolls should be increased because of the exemption of American coastwise vessels. Our British cousins might bear in mind that the Suez Canal pays a profit. If the worst comes to the worst, the United States government easily might increase tolls to a level just under the cost of steaming via Magellan and use the receipts for the subsidy of an American merchant marine. Perhaps such a course would prove even more unpopular abroad than would remission.

The Suez Canal

A British correspondent sends the following:

Traffic through the Suez Canal is rapidly recovering from the disastrous effects of the war, during which it fell off to the extent of 50 per cent, as shown by the figures given below. There can be very little doubt that within the next two or three years the figures of 1912-1913 will be reached again; a 25 per cent increase will suffice to bring up the number of steamers using the canal to 5000 annually.

The following table shows canal business since 1900:

Peace Years			
Year	Vessels	Net tonnage	Receipts
1920	4009	17,574,600	\$29,169,000
1919	3986	16,013,800	27,580,000
War Years			
1918	2622	9,251,600	15,978,000
1917	2353	8,368,900	12,316,000
1916	3110	12,862,400	15,525,000
1915	3708	15,266,100	17,957,000
1914	4802	19,409,400	23,471,000
Peace Years			
1913	5085	20,033,800	24,317,000
1912	5373	20,275,100	26,193,000
1910	4533	16,581,800	25,043,000
1905	4116	13,134,100	21,862,000
1900	3441	9,738,100	17,399,000

High Mark in 1912

Before the war canal traffic showed a tolerably steady increase up to 1912, when it reached its high-water mark; there was then a slight setback, followed by the war; the recovery since the armistice has been retarded by the recent depression of trade throughout the world. The

vessels passing through the canal belong to twenty or more different nations, but more than 50 per cent are British.

The countries mainly represented before the war were the United Kingdom, Germany, France, Holland and Austria; now most of the vessels belong to Great Britain, Japan, Holland, Italy and France in the order named. German vessels are again using the canal after an absence of five years, and we may expect to see their number increase rapidly as their mercantile fleet war losses are made good.

Japanese Are Second

Notable points are the limited use the French make of the canal and the remarkable increase of the Japanese steamers using it. The Japanese are now the second largest users. American shipowners find the Panama Canal more convenient; therefore only a small number of American vessels use Suez.

The nationalities of steamers using the Suez Canal are as follows:

	1920	1919	1918	1915	1910	1905	1900
Great Britain	2359	2679	1862	2736	2778	2484	1935
Germany	3	.....	.....	.....	635	600	462
France	184	112	102	171	240	272	285
Holland	330	181	1	334	259	219	232
Italy	188	117	200	124	87	91	82
Japan	385	438	162	119	72	.....	63
United States	132	54	5	1	8	6	22

Most of the vessels using the canal navigate it both day and night; only a small minority navigate it during the day only; and there is necessarily a great difference in the duration of the passage. Before the war it was made within eighteen hours by steamers navigating it both day and night; during the war the average was about twenty-two hours; now the former rate has been restored. Steamers navigating by day only average twenty-six hours and thirty minutes. There have been no marked changes in the working of the canal during the last two decades as regards the time required to complete the passage by steamers navigating day and night. A state of efficiency was reached twenty years ago, which has been maintained and hardly can be improved upon. The steamers using the canal are mainly trading vessels; there are a limited number of mail steamers and a varying number of warships, transports and government chartered vessels, also a few ships in ballast.

Number of Mail Steamers

The mail steamers are now mainly British with some French and Ital-

ian; their number during recent years has been as follows: 1920, 487; 1919, 303; 1918, 87; 1915, 545; 1910, 964; 1905, 823; 1900, 773.

During many years German mail steamers outnumbered British. The vessels passing through the canal have been increasing in average size for a long series of years; the following figures show the changes during recent years: 1920, 4383 tons; 1919, 4017 tons; 1918, 3668 tons; 1915, 4117 tons; 1910, 3658 tons; 1905, 3191 tons; 1900, 2830 tons.

The draft of water of steamers passing through the canal has also deepened as the sizes increased; the draft has increased seven feet in two decades and has now possibly reached a stage not likely to be much exceeded. The changes during recent years are shown below:

1900—23 ft. 0 ins. to 25 ft. 7 ins.
1905—24 ft. 7 ins. to 26 ft. 3 ins.
1910—26 ft. 3 ins. to 28 ft. 0 ins.
1915—27 ft. 0 ins. to 29 ft. 0 ins.
1918—29 ft. 0 ins. to 30 ft. 0 ins.

The ultimate intention is to have

a uniform depth of twelve meters (thirty-nine feet) over all.

Post-War Traffic

The vessels passing through the canal since the war ended may be classified as follows:

Trading steamers loaded:
1919—No. 2068, 8,542,000 net tons.
1920—No. 2320, 10,235,000 net tons.

Trading steamers in ballast:
1919—No. 477, 1,679,000 net tons.
1920—No. 400, 1,406,000 net tons.

Mail steamers:
1919—No. 303, 1,525,000 net tons.
1920—No. 487, 2,531,000 net tons.

Government vessels:
1919—No. 1138, 4,266,000 net tons.
1920—No. 802, 3,400,000 net tons.

The government vessels include warships, transports and chartered vessels. Ships that have recently passed through the canal in ballast have increased largely, no doubt due to the general trade depression. The transit dues earned by the canal show large increases over pre-war times, due to increased tolls having been levied on a smaller traffic. The toll was formerly \$1.20 and has been increased to \$1.68 (6 fr. 25c to 8 fr. 50c), an increase of 36 per cent.

Transit dues	Total receipts
1920— \$28,742,000	\$51,350,000
1919— 27,432,000	35,462,000
1913— 24,168,000	21,686,000

The net profits available for distribution have been for 1920 \$27,580,000, and for 1919 \$20,011,000. All these amounts are normal values. Profit is distributed as follows: 71 per cent goes to the shareholders, 15 per cent to the Egyptian government, 10 per cent to the founders, 2 per cent to the administration, and the remaining 2 per cent to the working staff.

Canal Well Maintained

The canal is maintained in an efficient condition. During the last year 2,107,500 cubic meters of sand and mud have been removed from the bed, an increase of 51 per cent on the previous year.

Before the war the average number of passengers traveling through the canal was 248,000, producing an average annual revenue of \$464,000. The number of persons passing through the canal since the war may be subdivided as follows:

	1919	1920
Ordinary passengers	129,477	194,873
Military	394,224	266,549
Emigrants and others	3,801	38,725
Total	527,502	500,147
Receipts	\$991,000	\$955,000

This vast military traffic is not likely to continue; for within a year or two normal conditions probably will have been re-established.

American and Foreign Wages

The wages of the crew for a 7500 deadweight ton coal-burning steamer are 50 per cent greater for an American than for a British vessel, with the pound sterling converted at \$3.73, says Commerce Reports, the publication of the Department of Commerce. Not only are the wages per man higher but a larger number are used, particularly in the engine

room, as will be seen from the table below, which, for the American vessel, is based upon the wage agreement effective since May 1, 1921, and for the British vessel upon the scale in use during July, 1921. Wages make up about one-sixth of the total operating costs of an American vessel, with 16½ per cent fixed charges based on a \$50 per ton valuation.

The table gives a comparative view of our current American and

British wages under the above conditions, the pound sterling being converted at the rate of \$3.73.

A comparison of wages for each rating is given here with on the basis of agreements in force during July, 1921, in the United States, Great Britain, Sweden, the Netherlands, and Denmark. The pound sterling is converted at \$3.73, the Swedish krona at 21 cents, the Dutch guilder at 31 cents, and the Danish krone at 17 cents.

Effective October 18 the Pacific Coast-West Coast South America Conference made the wheat rate \$10

Current scales on American, British, Swedish, Dutch, and Danish 7,500 dead-weight ton steamers.

Rating	American	British	Swedish	Dutch	Danish
Captain	\$120.00	\$108.00	93.25	\$127.00	\$127.50
First officer	180.00	95.25	\$127.00	\$99.50	\$127.50
Second officer	145.00	79.00	79.00	79.00	79.00
Third officer	145.00	63.41	85.20	71.30	76.50
Fourth officer	145.00	60.00	77.00	67.20	76.50
Chief engineer	200.00	111.80	85.20	127.00	127.50
First assistant engineer	180.00	95.00	85.00	114.50	114.50
Second assistant engineer	165.00	82.50	85.00	100.00	100.00
Third assistant engineer	165.00	78.83	80.00	97.75	97.75
Fourth assistant engineer	165.00	67.14	80.00	97.75	97.75
Junior	165.00	60.00	80.00	97.75	97.75
Chief wireless operator	107.00	63.78	80.00	97.75	97.75
Assistant chief wireless operator	85.00	55.93	80.00	97.75	97.75
Carpenter	85.00	52.50	63.00	69.00	54.63
Carpenter's mate	85.00	50.00	63.00	69.00	54.63
Boatman's mate	77.50	45.00	63.00	69.00	54.63
Boatman	77.50	44.76	58.27	69.00	54.63
Able seaman	72.50	44.76	58.27	69.00	54.63
Ordinary seaman	52.50	43.20	37.80	41.95	34.00
Boys, cabin	30.00	23.01	37.80	18.85	21.00
Deck engineer	85.00	50.00	63.00	69.00	54.63
Pumpman	85.00	50.00	63.00	69.00	54.63
Donkeyman	85.00	50.00	63.00	69.00	54.63
Stowkeeper	85.00	50.00	63.00	69.00	54.63
Oilier	85.00	45.00	60.00	69.00	54.63
Coal passer and wiper	65.00	44.76	58.27	31.00	35.55
Water tender	85.00	45.00	63.00	69.00	54.63
Chief steward	130.00	70.97	100.00	100.00	100.00
Second steward	130.00	65.00	100.00	100.00	100.00
Assistant steward	130.00	65.00	100.00	100.00	100.00
Cook	85.00	67.14	80.00	69.00	76.50
Chef	85.00	67.14	80.00	69.00	76.50
Assistant cook	85.00	67.14	80.00	69.00	76.50
Utility man	72.50	67.14	80.00	69.00	76.50
Boys, mess	60.00	23.01	37.80	18.85	21.00

* Bonus included in salary.
† Under 1 month.

* 1 to 2 years.
† Over 2 years.

Over 1 month.

Comparison of scales for month on American and British steamer of 7,500 dead-weight tons.

AMERICAN CREW (49 MEN).		BRITISH CREW (40 MEN).	
Deck department (17 men):		Deck department (12 men):	
Master	\$230.00	Master	\$132.00
First mate	180.00	First mate	100.25
Second mate	165.00	Second mate	90.25
Third mate	145.00	Third mate	85.00
Carpenter	85.00	Carpenter	63.41
Boatman	85.00	Boatman	60.00
2 able seamen	52.50	2 ordinary seamen	45.00
3 ordinary seamen	157.50	2 ordinary seamen	313.62
1 wireless operator	107.00	1 wireless operator	60.78
Total	1,757.00	2 wireless operator	65.91
Engine-room department (24 men):		Total	
Chief engineer	270.00	1,005.00	
First assistant engineer	190.00		
Second assistant engineer	165.00		
Third assistant engineer	145.00		
Deck engineer	85.00		
Stowkeeper	85.00		
3 oilers	255.00		
9 firemen	675.00		
6 coal passers	510.00		
Total	2,260.00		
Stewards department (8 men):		Engine-room department (17 men):	
Chief steward	120.00	Chief engineer	111.80
Chief cook	80.00	Second engineer	85.25
Second cook and baker	75.00	Third engineer	79.83
Utility man	72.50	Fourth engineer	76.50
2 messmen	140.00	5 firemen	408.17
2 mess boys	150.00	1 donkeyman	73.00
Total	632.00	Total	990.78
Grand total of wages per month		Stewards department (6 men):	
Average wage per day	134.30	Chief steward	70.87
		Second steward	60.04
		2 assistant stewards	45.49
		3 stewards	87.14
		Second cook	52.22
		Total	267.76
		Grand total of wages per month	
		Average wage per day	
		78.45	

a short ton instead of \$9 a long. The division between large and small parcels of lumber was set at 300,000 feet instead of 500,000, and rates were fixed as follows: to Callao, Mollendo, Talara, Antofagasta, Arica and Iquique, \$18 for large lots, \$20 for small; to all other ports, \$20 and \$22. These are reductions ranging from \$5.50 to \$2.

U. S. Shipping and Panama

During the fiscal year 1921, in spite of the world-wide depression, which resulted in the laying up of hundreds of ships, a new high record for American tonnage was established at the Panama Canal. The number of American ships making the transit was 1212 out of a total for all nations of 2892, says the Panama Canal Record. These figures do not include vessels of the United States Navy or other government-owned or chartered vessels not engaged in commercial service and exempt from the payment of tolls. The aggregate net tonnage of these 1212, measured according to Panama Canal rules, was 4,874,477, and they carried 5,179,350 tons of cargo. The nearest competitor of the United States in canal traffic was Great Britain with 970 vessels of 3,965,613 net tons, carrying 3,721,932 tons of cargo. American vessels carried 45 per cent of all cargo passing through the canal, and British vessels 32 per cent. The continuous increase of American shipping using the canal since it was first opened to navigation in August, 1914, is shown by the following table:

Fiscal Year	Atlantic to Pacific	Pacific to Atlantic	Total
1915.....	231	239	470
1916.....	114	124	238
1917.....	198	256	454
1918.....	224	404	628
1919.....	258	518	786
1920.....	493	636	1129
1921.....	581	631	1212

The low figures for the fiscal year 1916 are accounted for by the circumstance that the canal was closed to navigation by slides in the Gaillard cut from September 18, 1915, to April 15, 1916. Subsequently the traffic was adversely affected by the war. Since the armistice it has grown rapidly and continuously.

1921 Traffic by Trade Routes

The 1921 traffic moved over the trade routes shown in the accompanying table.

Included under "miscellaneous trade routes" in the tabulated statement above are voyages between the West Indies and the West Coast of North America, the West Indies and the West Coast of South America, the United States and Central Amer-

AMERICAN SHIPPING USING THE PANAMA CANAL DURING THE FISCAL YEAR 1921; SEGREGATION BY TRADE ROUTES.

	Ships	Cargo tons
United States coastwise, Atlantic to Pacific	177	698,479
United States coastwise, Pacific to Atlantic	145	673,959
East coast of United States to west coast of South America	129	419,994
West coast of South America to east coast of United States	152	629,274
Europe to west coast of North America	20	68,709
West coast of North America to Europe	106	736,160
East coast of United States to Far East	68	502,712
Far East to east coast of United States	23	140,260
East coast of United States to Australasia	12	88,789
Australasia to east coast of United States	17	87,383
East coast of Mexico to west coast of North America	29	286,311
West coast of North America to east coast of Mexico	47	14,453
East coast of Mexico to west coast of South America	36	296,342
West coast of South America to east coast of Mexico	32	
East coast of Mexico to Balboa	5	72,452
Balboa to east coast of Mexico	11	
East coast of Mexico to west coast of Central America	1	4,478
East coast of United States to Balboa	12	95,906
Balboa to east coast of United States	10	
East coast of United States to west coast of Canada	9	58,486
West coast of Canada to east coast of United States	7	32,809
Cristobal to west coast of South America	30	2,731
West coast of South America to Cristobal	19	15,061
Cristobal to west coast of North America	23	29,972
West coast of North America to Cristobal	23	14,578
East coast of South America to west coast of North America	8	31,927
West coast of North America to east coast of South America	3	15,941
Miscellaneous trade routes, Atlantic to Pacific	20	37,842
Miscellaneous trade routes, Pacific to Atlantic	41	123,334
Total	1,212	5,179,350

ica, Cuba and the Far East, the Far East and Europe, the West Coast of South America and Europe, the West Coast of North America and South Africa and local vessel movements.

History of Intercoastal Trade

The most important American trade through the canal is that from coast to coast, with a cargo tonnage of 1,399,814 carried in 323 vessels. The history of this trade is peculiar. In the first fractional year of canal traffic (August 15, 1914, to June 30, 1915) it engaged 335 vessels carrying 1,846,658 tons of cargo. During the following year the canal was closed for seven months, and in the interval the vessels which had maintained a coastwise service were diverted to war trades in the North Atlantic, where they remained until the close of the war and during the era of high freight rates which followed it. It was only after the slump set in that serious attention was once more given to the development of the trade from coast to coast. It is now growing rapidly, but the figures for 1921, although they show a notable increase over those for 1920 and other recent years, still fall short of the record set in 1915. It is reasonable to assume that if the war had not arrested its normal development, the coastwise trade would be far more important than it now is, and that it is capable of great expansion. An interesting and widely

advertised feature of the traffic this year was the shipment to Eastern markets by sea of a portion of the Northwestern apple crop and the California orange crop. There was also a notable increase of lumber shipments from the Pacific Coast.

Competitive Trade Routes

The coastwise trade is an American monopoly; but in the other trades served by the canal, American ships are in competition with the ships of foreign nations, particularly Great Britain, Japan and Norway. In the important trade between Europe and Australasia American vessels did not figure at all, and in the trade between Europe and the West Coast of South America only four American vessels passed the canal, all northbound, with 31,800 tons of cargo. In the oil trade between the Mexican fields and the West Coast of South America American tankers carried 296,342 tons out of a total 654,659 tons. With this single exception the trades in which American vessels secured any considerable tonnage had the United States either as origin or destination.

In the trade between Atlantic and Gulf ports of the United States and the West Coast of South America, the total southbound cargo was 933,261 tons. Of this, American vessels carried 45 per cent, British vessels 15 per cent, Japanese vessels 12 per cent, and Norwegian vessels 7 per

cent. Although the trade of other nations has not yet been analyzed in detail, it is probable that the remaining 21 per cent was carried in Chilean and Peruvian bottoms. The northbound cargo aggregated 975,597 tons. American vessels carried 64 per cent of the total, British vessels 14 per cent, Norwegian 10 per cent, and Japanese approximately 5 per cent.

Australian Trade to British

In the trade between Europe and the West Coast of North America there is a great preponderance of eastbound cargo. Of this, American vessels carried 55 per cent, British vessels 26 per cent, and Norwegian vessels 4 per cent. Swedish, Danish and Dutch vessels were also operating over this route, and probably account for most of the remaining 15 per cent. Of the westbound cargo, which was relatively unimportant, American vessels carried 27 per cent, British 14 per cent, and Norwegian 13 per cent.

Of cargo moving from Atlantic and Gulf ports to the Far East, American vessels carried 41 per cent, British vessels 29 per cent, and Japanese vessels 27 per cent. Of cargo moving from the Far East to Atlantic and Gulf ports, American vessels carried 32 per cent, Japanese 38 per cent, and British 23 per cent.

In the trade between the United States and Australia, British vessels had a decided advantage, carrying 71 per cent of the total outward bound cargo as against only 14 per cent in American bottoms. Of cargo moving over this route in the opposite direction American vessels carried 56 per cent and British vessels 44 per cent.

Of oil shipments from the Mexican fields to the Pacific Coast north and south of Panama, American vessels carried 60 per cent and British and Norwegian vessels shared the remainder.

Principal American Lines

The United States Shipping Board owned 451 of the 1212 American vessels which used the canal in 1921. The more important private owners were: Standard Oil Company, with 128 vessels; W. R. Grace Company, 94; Pacific Mail Steamship Company, 84; United States Steel Products Company, 53; Panama Railroad Steamship Line, 50; Luckenbach Line, 37; American-Hawaiian Line, 33; Union Oil Company, 25; Standard Transportation Company, 12; Crowell & Thurlow, 12; Robert Dollar Company, 11.

Briefs

An order issued by Chairman Lasker of the Shipping Board rescinds

his former order prohibiting vessels of the North Atlantic & Western from calling at New York, and the company's freighters, all of which are owned by the board, will be free to make that port. The former prohibition was one result of the fight between the North Atlantic & Western and private companies engaged in the intercoastal trade.

* * *

Swayne & Hoyt have been appointed San Francisco and Los Angeles agents of the Furness-Prince Line's newly-established Pacific Coast-Europe service, and Frank Waterhouse & Company will act in Oregon and Washington.

* * *

Frank K. Hitching of San Francisco announces that the Congress Line, which as agent of the United States Transport Company was forced out of the intercoastal trade by the Shipping Board a few months ago, has been reorganized and will re-enter the service. The first vessel dispatched will be the Princess, formerly the J. L. Luckenbach. Calls will be made at Baltimore, New York, Los Angeles, San Francisco, Portland and Seattle. Mr. Hitching will act as San Francisco agent. The Northwest Shipping Company will represent the Congress Line in Portland.

* * *

The Kingsley Navigation Company of Vancouver, B. C., has added the steamships Chilkoat and San Antonio to its California-British Columbia service, which was being maintained with the steamship E. D. Kingsley.

* * *

The northbound freighting business of the Parr-McCormick Steamship Line, operator of vessels in the Pacific Coast trade, has been transferred to the McCormick Steamship Line, effective November 1. The Parr-McCormick Line will continue to handle vessels as managing owner and under charter in the coastwise and offshore trades.

* * *

The joint service of the Kosmos and Roland lines between Germany and Peru via Panama was opened with the dispatch of the steamship Theben, 1757 net tons, from Hamburg September 20. One sailing a month will be maintained. On June 30 the Kosmos Line owned 11,000 gross tons of shipping. Other new steamship services recently announced or opened are: Canadian Government Merchant Marine, two combination vessels between Canada and the Bahamas, Jamaica and British Honduras; Furness-Withy, two pas-

senger vessels in winter and one in summer between New York and Bermuda; East Asiatic Company, monthly service between Copenhagen, Hamburg, Antwerp and Havana, Progresso, Vera Cruz, Tampico; Canadian Pacific Railway, monthly sailings between St. John (winter), Montreal (summer), and Havana, Kingston and Boston; Fred Olsen Company, between Scandinavia and Germany and the River Plate.

* * *

Indications are that favorable action is unlikely in the case of H. R. 6645, which would permit Canadian vessels and railroads to transport goods between Alaska and the United States.

* * *

Contracts for transporting United States mails to and from Southeastern and Southwestern Alaska have been awarded to the Alaska Steamship Company and Pacific Steamship Company at \$2000 a round voyage. Postal clerks will be carried on the companies' vessels.

* * *

The board of harbor commissioners of the Territory of Hawaii has prepared a tentative schedule of wharfage charges, which it proposes to impose upon freight passing over territorial wharves. Heretofore the board has received no revenue from freight passing over its wharves, its income having been derived from port charges and pilotage fees; but recent action of Congress permits the levying of wharfage. On incoming freight the proposed schedule calls for 20 cents a ton on general merchandise and 30 cents a thousand feet of lumber; and in outgoing freight 15 cents a ton on sugar, coffee, pineapples and bananas and 20 cents on general merchandise. Interisland freight would pay 10 cents on general merchandise.

* * *

Advices from Japan say that the Toyo Kisen Kaisha has received permission of the Department of Communications to reduce sailings in its South American subsidized service from twelve to eight a year.

* * *

The Matson Navigation Company has announced a reduction of 50 cents a ton on freight moving to and from the Hawaiian Islands, effective January 1. General cargo will be \$6 as compared with \$6.50; canned pineapples will drop to \$5.50, raw sugar to \$4.50 and refined to \$5.50. The cement rate of \$5 will not be changed. This will be the third reduction made by the Matson Line within a year.

With Exporters and Importers

Rate Tendencies

Two opposing factors in ocean rate-making are beginning to make themselves apparent. On the one hand is an increase in cargo offerings, which is of wider extent than was at first apparent; on the other is the prospect of a great number of idle vessels being returned to service, with a consequent depressing effect on rates. These factors probably will tend to counterbalance each other for years, even if trade should improve rapidly; temporary ascendencies may be gained from time to time, however, as shipowners are affected by apparent changes. Unquestionably the weightiest single force making for slowly rising rates is the United States Shipping Board, which controls the greatest single fleet of the world and probably would be less responsive to larger cargoes than would private owners. In fact, the board holds the key to the entire situation and could cast the deciding vote in almost any trade: by putting tonnage into service it could depress rates; by holding vessels idle it could elevate them; what it might do in any given situation would depend upon several considerations, among which may be enumerated the cost of preparing idle vessels for sea, the comparative expense of operating vessels and keeping them in idleness, the apparent permanency of improvement, and so on.

What of Foreign Owners?

Although the board evidently holds

the whip hand, the attitude of foreign owners may be of considerable, if lesser, importance. In general, private operators have declined to permit themselves to be stampeded into any rapid withdrawal of tonnage from the mud flats; but signs multiply that they are beginning to respond to increased freights. For example, the number of idle Japanese vessels decreased by 14 and the gross tonnage by 23,640 from August 15 to September 15. On the latter day 136,110 gross tons of shipping was idle, and at the end of the month 2,753,612 tons was reported in active service. Japanese idle tonnage was rather inconsequential, therefore, in comparison with that in service, and was almost negligible in comparison with the 956 vessels of the Shipping Board tied up at the same time. The board, moreover, was retiring more vessels while the Japanese were returning ships to service.

Due in part to the increased number of vessels and probably also in part to the temporary nature of much of the recent revival, freight rates in some quarters, notably from the Far East to Europe, have fallen back after a rise. Such changes may be traced also to an imperfect adjustment of tonnage, for increased offerings of cargo are likely to attract a disproportionate volume of shipping in one part of the world, while other trades remain unchanged or even might support additional vessels. As an example of the latter phenomenon may be cited Australia,

which, according to Birt & Company's shipping bulletin, has been able to supply sufficient cargo for all berth steamers loading for the United Kingdom and Continent; or the Pacific Coast, with transoceanic services to a minimum and cargo offerings increasing, is a case in point.

The Court of Last Resort

All considerations fortify the belief that the Shipping Board is the court of last resort. Any important release of idle tonnage would send a tidal wave through the world of rates, affecting all trades, even those in which the board has no vessels. In the absence of drastic action, however, the situation resolves itself to this: a revival of trade probably will be followed by immediate rate increases; these in turn by the appearance of more tonnage, which would tend to depress tariffs, though perhaps not to the former level; and so on, the net result being a gradual increase depending upon the degree of improvement in commerce. In the return of idle vessels to service the Shipping Board doubtless will do its share from time to time; but it easily might complicate things when rates rose sufficiently to permit its vessels to show an operating profit. Inasmuch as the board is not an ordinary operator, and desires above all to end its continuous drain on the United States treasury, a relatively high level of freights, such as would end operating deficits, conceivably might drag out the entire Shipping Board fleet vessel by vessel; and this would act to stay additional increases, although not necessarily to depress rates. The prob-



Traffic data on canned goods moving east from the Pacific Coast, compiled by the Luckenbach Steamship Company. Figures opposite the names of cities are railroad rates from seaboard

able trend, therefore, is a gradual increase in cargoes and rates (provided of course that business actually is on the mend), accompanied by minor fluctuations, until a certain level, which may be described as the Shipping Board's profitable stage, is attained; thereafter the increase is likely to be slowed up materially until practically all the tonnage of the board is absorbed. Some privately-owned bottoms might remain idle when the board's fleet was all engaged, and the return of such vessels might act in the same manner, creating, that is, another plateau in the rate curve, which would be followed by a second rise as the world's tonnage was absorbed. This state of things is not likely to obtain for years; consequently, really stable and profitable rates are in the far offing, and shippers will continue to find the situation to their liking.

Three Rate Wars

In three important trade routes lively little rate wars have broken out practically simultaneously. Pacific Coast-Europe, Atlantic Coast-Brazil and Orient-Pacific Coast rates have broken under the pressure of competition; in two of the trades the conferences have been unable to hold together; and in the third, the Pacific Coast-Europe route, an attempt to organize a conference has failed.

Too Much Tonnage

Before the recent irruption of steamship lines into the European service, there was no great difficulty in maintaining rates, especially in view of the close working agreement that existed between the European-Pacific Line of Williams, Dimond & Company (now supplanted by the American-Hawaiian) and the Harrison Direct Line, represented by Balfour, Guthrie & Company. These companies were the oldest in the trade and were able to hold the newcomers in line with a fair degree of success prior to the entrance of a veritable host of operators this year. Among the later entrants the powerful Royal Mail Steam Packet and French Line most disturbed the serenity of things, for earlier competition had not been so keen as it now became. With a view to organizing a conference before conditions should become acute, the American-Hawaiian proposed that an agreement be consummated; the proposal was rejected, and rates immediately began to fall, dried and canned fruit declining 15 cents or perhaps more. Despite the large eastbound cargoes offering, the berth now appears to be over-tonnaged, and westbound

freight is practically non-existent, so that the stage is well set for trouble.

Brazil Conference Defunct

In the Atlantic-Brazil trade the conference has broken, with a natural reaction on Pacific-East Coast tariffs, which necessarily were closely related to those of the other ocean. Of this trouble the immediate cause was the decision of Funch-Edey to work independently and the acceptance of the challenge by Furness-Withy, who said that they would meet whatever competition existed. These few well-chosen words split the conference; the foreigners and perhaps most of the Americans wandered far afield, each twirling a bludgeon; while the two Shipping Board operators, the International Freight Corporation, in charge of cargo vessels, and the Munson Line, operator of passenger liners, crept together for aid and comfort. They are not saying what their new rates are, but it is known that the decline since November 3 ranges from \$1 to \$15 a ton, the average fall being about \$2 at the middle of the month.

There has been no change in the Argentine section of the North Atlantic-East Coast South America Conference.

Oriental Tariffs Down

In the Far East all is not well. Within the last three months rates have broken one by one, and clear indications are that the end is not yet. Rattan furniture from Hongkong is down to the grotesque rate of \$3 for 40 cubic feet as against a rate of \$5 that existed prior to October 30. Such a charge would be low enough in the westbound service, which has some weighty cargo, such as iron and steel, that leaves space for light stuff; in the eastbound trade, which lacks heavy goods, it is absurd. General merchandise from Manila fell from \$15 to \$12.50, weight or measurement, September 21; beans and peas from Shanghai from \$12.50 to \$10, weight, October 7; Japanese tea from \$8 to \$5, measurement, August 9; silk, 100 pounds, from \$7.50 to \$6.75, August 25; the minimum bill of lading is down from \$10 to \$5; a firm rate of \$6 on Oriental rice has been established; and on September 30 Saigon rice was fixed at \$7.50, direct loading. These last two rates represent declines, but the amounts cannot be stated definitely.

Mitsui a Disturber

For several months the eastbound rate situation has been growing more and more unsatisfactory. The Mitsui Bussan Kaisha, a non-member,

was a disturbing element, and its rate-cutting and the pretext thus afforded to other lines, tended to beat down tariffs and, what was more important, to engender much suspicion. At length the Shanghai general committee of the Shipping Board conference decided on September 20 that the Japan sub-committees be made independent of the Trans-Pacific Freight Tariff Bureau of Japan in fixing rates, although they might cooperate, when advantageous, with existing conferences and bureaus for the maintenance of tariffs. Operators of American tonnage as individuals might be members of any bureau, the Shanghai committee decided, but the Shipping Board conference and its various sub-committees should maintain freedom of action. The committee, however, disclaimed any intention of opening a rate war unless forced to do so.

Divorce Decree

This action at Shanghai was brought about by the Trans-Pacific Freight Tariff Bureau of Japan in granting permission to individual operators to meet Mitsui and other competition. As a result of that decision the Blue Funnel cut rates to 15 per cent below published tariffs. That line blamed the conference for the tangle; the O. S. K., N. Y. K. and T. K. K., on the other hand, sought out the Shipping Board operators, pleaded guilty to rate-cutting and sought to make peace, saying that they were in favor of maintaining rates thereafter. In spite of this conciliatory attitude of the Japanese, who, thought some Americans, were in earnest at last, the Kobe sub-committee found much that was unsatisfactory in the bureau, especially in a provision permitting members to meet actual rate cuts for seven days prior to departure and five days subsequent to departure of a non-conference vessel. Upon a report being submitted to Shanghai, the Japan sub-committees were authorized to go their own way. Just how serious was this step remains to be seen.

Too Late!

Reductions in import and export railroad rates, decided upon at a meeting of the Transcontinental Freight Bureau in Chicago in October, which probably will be made effective about December 15, have not caused a ripple on the Pacific Coast. Some newspapers, more enthusiastic than well informed, have been rather ecstatic in prophesying an immediate revival of trade, but it is safe to say that they are alone in their prognostications. No shipping operator joins with them.

The reductions, especially in the case of iron and steel, are belated. Had the new 60-cent rate from Rate Basis 2—that is, Chicago—been published several months ago some business might have resulted, for time was when the North Atlantic-Far East rate stood at \$12 a long ton as against \$6.50 to \$8 today. But the fall of the North Atlantic rates within the last three months has been disastrous, the conference has lost practically all semblance of control, and no one credits published tariffs with even approximating ruling rates. The trans-Pacific rate, on the other hand, remains steady at \$5 a short ton, or only a little less than the North Atlantic, despite the great difference between the transcontinental rate of \$12 and the Pittsburgh-New York export rate of \$5.70. At a time when the North Atlantic stood at \$11 a long ton a transcontinental export rate of 55 cents was requested of the railroad executives on the ground that a precise equalization of the Chicago-Pacific and Pittsburgh-Atlantic rates required 50 cents, but that the Pacific, because of its faster service, could demand and receive a 5-cent differential. The new rate is 5 cents more than was requested, and in the meantime the North Atlantic rate has broken \$3 to \$4.50. In such circumstances those who anticipate a restoration of the export steel trade are dreaming.

Some Business Expected

It does not follow, of course, that some business may not result. Gary and Chicago have been shipping a few hundred tons now and then and may ship more.

Rate Basis 1, east of Chicago, will receive a new export rate of 69 cents as against a former rate of 80, the differential of 9 cents between Pittsburgh and Chicago thus being maintained.

Among other reductions are: sulphate of ammonia, Rate Basis 2 and Birmingham, from 70 to 60 cents; Minnequa, Colorado, from 70 to 46; all commodity, Rate Basis 2, from \$2 to \$1.50, which will be followed by an ocean reduction from \$14 to \$12, weight or measurement; knocked down railroad cars, Rate Basis 1, from 87½ cents to 69; Rate Basis 2 and Birmingham, 87½ to 60; Minnequa, Colorado, 87½ to 46 cents. All changes affecting lines east of Chicago are subject to concurrence of those companies.

It is evidently difficult for the Pacific Coast to reconcile itself to the complete diversion of its old Oriental export and import business; but the Pacific Coast must realize two

things: that the Panama route has a decided advantage at all times and especially during a depression such as that of today; and that no success in maintaining an import and export rate structure may be expected so long as ocean rates fluctuate wildly. The necessarily involved and cumbersome methods of the railroads cannot possibly keep pace with the over-night breaks in ocean tariffs that the shipping world is discovering every morning.

More Rail Reductions

More than one domestic rate reduction has been made or is being planned by transcontinental railroads in order to enable them to meet intercoastal steamship competition. One of the most important under way affects lumber and shingles, on which, it is reported, the railroads intend to make rates of 90, 88½ and 85 cents, depending upon destination, as against \$1.06½, 94 and 87½. The greatest reduction would be to New York and Boston, but even with a 90-cent rate effective there are those who hold that the railroads could not hope to take business from steamship lines. At the present time approximately 40 per cent of all new business placed with members of the West Coast Lumbermen's Association is for cargo delivery, with approximately two-thirds destined coastwise and intercoastal and one-third offshore. A statement issued by the Seattle Chamber of Commerce says regarding the rail reduction: "While the rail rate of 90 cents on fir, spruce and hemlock from Western Washington to North Atlantic markets is welcomed by Seattle lumber interests, the water carriers continue to get the business. The West Coast Lumbermen's Association says that steamers, prior to the rail rate increase, handled less than 1,500,000 feet of lumber through the Panama Canal in six months' time. However, they will wind up 1921 with intercoastal deliveries amounting to more than 175,000,000 feet. Indications are that steamship lines by spring will have to add sufficient tonnage to take care of 50,000,000 feet a month from North Pacific mills. On the basis of present water rates lumber is being delivered on the

Atlantic seaboard at \$4 a thousand feet less freight than is proposed under the railroads' new tariff."

Reductions averaging about 20 per cent and in some cases as high as 50 per cent were announced early in November. Both eastbound and west-bound business would be affected. Rates designed to meet Panama Canal competition must be submitted to the Interstate Commerce Commission for waiver of the long and short haul clause, however. Reductions in grain and hay rates averaging 16 per cent have been ordered by the commission throughout the Western United States. It does not yet appear whether the reductions will result in larger export cargoes.

The Cotton Rate

That the fight of Galveston against a Pacific Coast cotton rate of \$1.35 is something more than appears on the surface was made evident at an Interstate Commerce Commission hearing in San Francisco in November. Galveston evidently intends to wage a spirited struggle against the Pacific Coast for freight destined to and from the Southwest, and with the Atlantic for cargo bound to and from the Central States. Such an aim as this tends to subordinate the immediate issue of a 15-cent reduction on cotton.

It will be recalled that the Interstate Commerce Commission, acting at the solicitation of Galveston and the I. G. N. Railroad, suspended a proposed reduction in the Pacific Coast export cotton rate. At the San Francisco hearing both sides unlimbered some of their heaviest artillery, with the result, according to qualified judges, that the transcontinental railroads demonstrated that a rate of \$1.35 would be compensatory and that therefore the I. C. C. scarcely could decline to permit its publication. But Galveston immediately served notice that a 15-cent reduction in the Gulf rate also would be published by interested railroads; if this were done, the relative situation of the Gulf and Pacific would remain unchanged. Apparently the one great obstacle to a 15-cent Gulf reduction would be New Orleans, which might fight the proposal, but if New Orleans were granted a corresponding

	Aug. 1, 1921, to Oct. 31, 1921	Aug. 1, 1920, to Oct. 31, 1920
Total to China and Japan	330,151	6150
Receipts at Pacific Coast ports	60,549	3081
Exports of San Francisco	16,128	2405
Exports of other Pacific Coast ports	44,421	676
Exports of Atlantic and Gulf	269,602	3069

COTTON EXPORTS BY BALES, 1921 AND 1920

cut, opposition in that quarter probably would cease.

Pending a decision by the Interstate Commerce Commission, cotton will continue to move largely through Gulf ports. One steamship line plying out of San Francisco had booked 48,000 bales between the announcement of the reduction and the I. C. C.'s suspension, and at the time of the hearing had lost 57½ per cent of this amount by cancellation.

Page Freight Report

San Francisco, November 16, 1921.

Since our last circular, dated October 17, not a single full cargo steamer has been chartered for grain to the U. K. or Continent, either from the North or San Francisco, but quite a large amount of space has been fixed in that direction by the regular liners from Portland, Puget Sound and Vancouver, and always with a lower tendency, at rates varying from 45/ in the last fortnight of October down to 30/ per ton in the last few days, probably about 20,000 tons being arranged. The U. S. Relief Association arranged space by one of the American-Hawaiian steamers of about 6000 tons to Riga at 45/. From San Francisco, parcels of barley have also been shipped at rates running from 50/ at the end of September down to 25/ for U. K. ports. We are glad to say there is a slightly better inquiry for barley for December/January, and we hope the worst has been seen.

The most active demand has manifested itself for steamers for November/December and even for January loading for Japanese squares to Moji-Yokohama range. Several steamers have been chartered at \$14 per thousand feet for this business, most of them being Japanese steamers. The schooner William Taylor was chartered on private terms for logs from Coos Bay to Japan. J. J. Moore & Company chartered the motorship Chile from the North Pacific to two ports Japan at \$14. Schooners Oregon Pine and Oregon Fir are also reported as having been fixed for lumber to Japan by Balfour, Guthrie & Company from the North Pacific on private terms.

Since the charter of the three Nielsen steamers, J. J. Moore & Company chartered the Norwegian steamer Helen at 5/9 per ton on the deadweight for one year trans-Pacific trading, delivery and redelivery on this coast, and we understand that another steamer has been chartered for two round trips between

the Orient and this coast at 6/ delivery and redelivery Shanghai.

Quite some business is being done in Cardiff coal to this coast. W. L. Comyn & Company having chartered the British steamer Ethelstan at \$16 to a port between San Diego and Puget Sound inclusive, option of Honolulu at 20/. Steamer Pacific and one other steamer unnamed have both been chartered at 20/ from Cardiff to Honolulu by British concerns, and more business is promised either to this coast or to the Islands from Cardiff, because the price at which the Cardiff coal is being sold is below what Australian or other coal can be landed for.

W. L. Comyn, combined with his coal charter on the Ethelstan, has chartered her for 75/ per thousand to Shanghai, with the option of 80/ to two ports in Australia. J. J. Moore & Company chartered the motorship Canada at 72/6, three ports Australia, and the motorship Parana at the same rate and the same conditions. Comyn has also chartered the schooner Eric at a reported rate of 80/ from the North to Sydney. The American Trading Company chartered the steamer Peebles at \$15 from the North Pacific to Australia, and they are reported to have chartered another steamer January/February at rates that are still unnamed.

For Africa two vessels have been chartered, one the Katherine MacKall by Comyn at \$25, and the other, the Annie M. Rolph, by Gates, Portland, at \$23.50.

For the U. K., H. R. MacMillan Company chartered the Japanese steamer Tofuku Maru at 120/ per thousand from British Columbia to three ports of discharge.

The schooner Hawaii was chartered by C. R. McCormick at \$10.50 per thousand feet full cargo of ties to Guaymas. Several schooners have been chartered for copra from different South Sea Islands to San Francisco at \$12 rates. The motorship Malahat has been chartered for coal from Newcastle, Australia, on private terms to Ahukini by J. J. Moore & Company, and the U. S. Navy has chartered three steamers for coal, one to Bremerton, the West Catanae at \$2.98 per ton, and two to San Diego, one of which is the Redhook at \$3.88 and \$3.92, respectively.

Balfour, Guthrie & Company have chartered a Danish training ship with Diesel motor for a general cargo from one or two ports in Europe to San Diego, San Francisco and Honolulu on private terms, and they have also chartered their own

vessel, the Monterey, for a cargo of nitrate to Honolulu. The rate has not yet been divulged, but we understand that nitrate freights are higher. We are glad to say that although rates are low, a better inquiry exists for lumber to different ports of the world.

PAGE BROTHERS,
BROKERS.

Beyfuss Freight Report

San Francisco, November 26, 1921.

Our previous report was dated October 24, and the healthier tone has kept up, manifested by the continuance of inquiries during the last month, but there has been no advance in freights.

Grain to Europe is practically dead as far as full cargo fixtures are concerned. Only one or two steamers are reported taken and rates are nominally 35/ at 40/. For some time we have had in this trade, as in other trades, the peculiar situation that parcel space by regular liners is often less than charterers are able to get by taking entire steamers.

Lumber to the Orient continues to show the greatest activity, many steamers having been reported in the past four weeks, although some of the fixtures were made previous to that time. Our records show not less than a dozen steamers (about 50,000,000 feet B. M. carrying capacity), and at this date rates are about \$14 at \$14.50. The large majority of this tonnage is Japanese and most of the steamers are coming to this coast in ballast to take these timber cargoes. Several of our sailers have also been chartered in this trade but in most cases they were able to get slightly better rates mainly because cedar logs were shipped.

Three or four steamers have been taken for full cargoes of lumber to ports north of Hatteras, rates ruling about \$16.50.

The bids for the transportation of navy coal from Hampton Roads disclosed some low figures: \$2.98 per ton to San Diego or Puget Sound was the lowest bid. The next group ranged from about \$4 to \$4.50 and the highest bids were \$6.90 to San Diego and \$10.05 to Puget Sound.

Australia has taken two full steamer cargoes at about 72/6 and a small sailer is reported at \$16 for this destination.

The lumber market to West Coast South America is very quiet and no fixtures were made, and but one full cargo of nitrate is reported coming this way—a sailer fixed to the Hawaiian Islands at about \$8.

The various inquiries for African

destinations resulted in the fixing of two large sailing vessels, both of which will make loading this year. The rates are \$23.50 at \$25.

C. BEYFUSS COMPANY,
BROKERS.

Japan and Fuel Oil

Another effort to formulate a national oil policy is being made in Japan. For several years the empire has groped rather blindly, or at least hesitatingly, without any great measure of success. The present finds it practically without domestic resources of a most important marine fuel—important both for the economical operation of its steam merchant marine and for the navy in time of war, and indispensable to the construction of any considerable fleet of motorships, to which the rest of the world is turning so rapidly. Without oil Japan finds itself in a situation of great embarrassment, and it certainly is curious that the country has not possessed itself of a sure supply by some means or another.

Domestic Production

In the Japan Advertiser of recent date appeared the following table of domestic production in koku (one koku equals 47.6 United States gallons):

Year	Production
1916	2,661,000
1917	2,612,000
1918	2,243,000
1919	2,060,000
1920	2,213,000
1921	1,109,000

Figures for 1921 are for January-July inclusive.

In the United States daily national production of oil was more than 915,000 barrels in 1917 and was about 1,180,000 in 1920. This serves to throw into high light Japan's shortage.

Very few Japanese merchant vessels burn oil. Until a few years ago the conspicuous exceptions to the rule were the Tenyo Maru and Shin-yo Maru of the Toyo Kisen Kaisha, but even those vessels used coal also. Lloyd's Register for 1921-1922 lists fifteen "Marus" of an aggregate gross tonnage of 106,882 fitted for oil fuel; at the same time, Japan possessed a total of 2033 steamers and motorships of 3,354,896 gross tons, so that oil-burning vessels were only a trifle more than 3 per cent of the total. Five of the fifteen were owned by the Toyo Kisen Kaisha, six by the Kawasaki Dockyard, and one each by the Osaka Shosen Kaisha, Nippon Yusen Kaisha, Teikoku Kisen Kaisha and Towa Kisen Kaisha. One hundred thousand tons

of vessels burning oil fuel is infinitesimal when compared with the enormous fleets of other countries, especially of the United States. The small amount is due largely to the lack of domestic oil and the general use of coal by steamships doubtless has made the development of a supply of oil less imperative.

Navy Uses Coal

The Japanese Navy still depends largely upon coal. The 1920 edition of *James' Fighting Ships* discloses the following:

No data regarding fuel of Kaga, Tosa, Amagi, Akagi, Atago and Takao, all capital ships, the first two of which had been laid down at the time of publication, the others being projected only.

No data regarding fuel of dreadnoughts Nagato and Mutsu.

Dreadnoughts Ise, Hiuga, Fuso, Yamashiro, maximum, 4000 tons of coal and 1000 tons of fuel oil each.

Dreadnought Settsu, maximum, 2,300 tons of coal and 400 tons of fuel oil.

Battle-cruisers Kongo, Hi-yei, Haruna, Kirishima, maximum, 4000 tons of coal and 1000 tons of fuel oil each.

Semi-dreadnought Aki, maximum, 2000 tons of coal and 170 tons of fuel oil; semi-dreadnought Satsuma, 2000 tons of coal and 300 tons of fuel oil.

Older cruisers ("battle-cruisers") Kurama, Ibuki, maximum, 2000 tons of coal and about 250 tons of fuel oil each; Ikoma, maximum, 2000 tons of coal and 150 tons of fuel oil.

Older battleships Kashima, Katori, Mikasa, Hizen (ex-Prussian), Asahi, Shikishima, Iwami, Suwo; coast defense battleships Fuji, Okinoshima (ex-Russian), Nishin, Kasuga; first class cruisers Aso, Idzumo, Iwate, Adzuma, Yakumo, Asama, Tokiwa; all these vessels burn coal only.

Some of the light cruisers and gunboats have space for a little oil.

If the eight new or projected capital ships ending with Mutsu be omitted, as of uncertain fuel, Japan is seen to have nine dreadnoughts or dreadnought-cruisers fitted for oil, their combined oil-bunker capacity being only 8400 tons; two semi-dreadnoughts, 470 tons; and three older cruisers (miscalled battle-cruisers), 650 tons—a grand total of 9520 tons. As was the case with the merchant marine, practically complete dependence is placed upon coal. It is, of course, possible, or even probable, that the newer capital ships will burn more oil and less

coal, as is the case with Britain's newer vessels; but it is nevertheless evident that Japan has been compelled to lag behind other countries in the use of oil.

Must Seek Foreign Supply

Officials of the Finance, Navy and Agriculture and Commerce departments were engaged in daily sessions, said the Japan Advertiser, in an endeavor to formulate a policy. That newspaper continued:

Whatever may be the nature of the policy which finally emerges, it is likely to contain provisions for various aspects of oil supply, including extension of prospecting, the acquisition of oil rights, encouragement of imports, conservation of oil resources by developing the use of coal and water power, storage, and consumption. It is evident that any encouragement of local production will only hasten the exhaustion of the already slender reserves, so that this may be taken to apply to territories elsewhere, possibly in lands to the north in which Japan has an interest, and in China. Fair sums of money, in fact, have already been laid out in this work, but little is known as to just what has been done. Respecting the acquisition of oil rights, it will be recalled that the Japanese government not long ago was in communication with the Dutch government regarding mining and drilling rights in the Dutch East Indies. Private Japanese companies have also been considering and negotiating for the purchase of oil rights in these islands for many months past.

How America Is Affected

The question of encouraging imports is related to a plan for the establishment of a government oil monopoly, which has been talked of from time to time and which is likely to receive serious consideration sooner or later. Such a step would involve the creation of an arrangement similar to that applied to tobacco, salt and camphor. It would at one stroke change the status of the large American and Dutch oil importing companies and might even force them to turn over their plant and storage facilities to the government. If such a step were taken the financial interests of the American concerns would not be likely to suffer, since the Standard and the Texas companies between them could still dictate the terms on which their oil was released if they worked in harmony. It is, however, much more likely that these and other firms would be permitted to continue their businesses under public license, importing and storing oil as heretofore. In such a case the government would be the only buyer unless it chose to designate certain distributors to act for it.

Shipbuilding

American Building

On November 1, according to the bulletin of the American Bureau of Shipping, there were 64 steel vessels of 899,767 gross tons under construction or contract in yards of the United States, as compared with 70 vessels of 542,117 tons September 1. Seven vessels of 70,300 tons were for the Shipping Board and 47 of 329,467 tons for private owners. Tankers lead all classes with 33 vessels of 247,016 tons; cargo vessels are second with 15 of 89,751 tons; and combination vessels, all for the Shipping Board, are last with 6 of 63,000. It is interesting to note that only one vessel of the 54 will be a coal-burner and that only six will burn either coal or oil, all others burning oil only. The largest number of vessels, 13, and the largest aggregate gross tonnage, 85,931, lie between the tonnage limits of 6001 and 7000. Five vessels, ranging between 13,001 and 14,000 aggregate 67,500 tons and hold second place.

Pacific Building

There were 6 steel seagoing merchant vessels of 85,750 deadweight tons under construction in yards of the Pacific Coast of the United States November 1, as compared with 10 of 129,350 tons October 1 and 73 of 746,040 November 1, 1920, according to returns compiled by Pacific Marine Review. Four vessels of 43,600 tons were delivered in October as follows: tankers for private account, 3 of 32,600 tons; freighter for U. S. S. B., 1 of 11,000 tons. There has been no change in the work on hand in Canadian yards.

The following tables show work as of November 1:

American Yards:	Vessels	No.	Agg'te D.W.T.
Freighter, U.S.S.B.	1	11,000	
Tankers, private	3	34,750	
Freighters, private	2	40,000	
Totals	6	85,750	

Canadian Yards:	Vessels	No.	Agg'te D.W.T.
Freight's, C.G.M.M.	2	16,740	
Comb'n'n, private	1	600	
Totals	3	17,340	

New Work Held Up

Bids received in July by the Red D Line for the construction of two passenger vessels for the Central American trade have been rejected, says the Atlantic Coast Shipbuilders' Association, and new bids will not be asked until the Merchant Marine Act has been made effective. The

company believes that the application of preferential rates and discriminatory duties is necessary in order for it to meet foreign competition. The City of New York is about to request bids for the construction of three new electric-drive ferryboats of about 3500 horsepower and about 230 feet long. The Merchants & Miners' Transportation Company is reported to be planning the construction of vessels in the near future.

Contracts have been placed by the Pennsylvania Railroad with the Sun Shipbuilding Company for the construction of two ferries for the Philadelphia-Camden service. The Staten Island Shipbuilding Company will build a tug, 136 by 27 by 13 feet, for the Staples Transportation Company. It is reported that 80-ton auxiliary schooners for the Boston-Portland-Eastport trade will be constructed at the Pushee yard, Dennysville, Maine. A fishing schooner will be built by the Arthur D. Storey yard, Essex, Massachusetts. The Marietta Manufacturing Company, Point Pleasant, Virginia, is constructing two twin-screw propeller boats, Memphis and Baton Rouge, for the Inland & Coastwise Waterways Service. These boats will be 760 gross tons each, 410 tons net, 200 feet long, 40 feet wide and 10 feet deep, and will be equipped with triple-expansion engines and watertube boilers.

The only new contract reported in the Orient in months has been placed with a Yokohama yard by Gonzales Ukon of Osaka. The order is for a 6000 deadweight ton steamer, to cost about yen 200 a ton.

Announcement is made that James Robertson, Alameda, will build the first ferryboat for the Golden Gate Ferry Company, San Francisco Bay. It will be in operation by May.

The Argentine government, represented by a naval commission headed by Captain Fleiss, is reported to be contemplating the building in the United States of six submarines of either single or double hull construction, involving an expenditure of more than \$12,000,000. The office of the Argentine naval commission is at 2 West Sixty-seventh street, New York City. Albert F. Haas, Newport, Rhode Island, has prepared the plans for a steel double ended screw steam ferryboat for the Jamestown-Newport Ferry Company, of Newport, Rhode Island, of the following dimensions: Length overall, 150 feet; length between perpendiculars, 123 feet; beam over

guards, molded, 48 feet; beam overall, 49 feet; depth, molded, 14 feet; draft, 8 feet. The steamer will be equipped with compound engine and Babcock & Wilcox boilers. Accommodations will be provided for 500 passengers and 32 automobiles. The vessel will cost about \$200,000 and bids will be asked for soon. The North Vancouver, B. C., council on October 15 received tenders for construction of a steel ferryboat, to be built according to plans drawn up by the Wallace Shipbuilding Company of that city.

One of the largest dredges in the world is nearing completion at the yards of the Canadian Vickers, Limited, Montreal, for the Department of Marine and Fisheries. It will be operated on the ship channel below Quebec. The dredge is 184 feet long between perpendiculars and 292 feet long overall, with a breadth of 48 feet and a depth of 20½ feet.

Yard Extensions

It is announced that plans are now under way to make the plant of the Baltimore Drydocks and Shipbuilding Company, Locust Point, Maryland, which was purchased by the Bethlehem interests September 28, one of the greatest ship repair yards in the world. The Bethlehem Corporation took over the management of the Locust Point yards October 1. J. M. Willis, vice-president and general manager under the retiring regime, has been retained as general manager. The property comprises two plants, one on the north and the other on the south side of Locust Point, adjoining the Fort Henry government reservation, and is valued at \$6,000,000, including the new purchase and the steel and shipbuilding plants at Sparrow's Point the Bethlehem holdings on the Baltimore waterfront are now estimated at about \$80,000,000. Although repair work is to be featured at the new plant for the present, it is indicated that shipbuilding will be resumed at a future date, the plant being operated as an auxiliary to the Bethlehem yards at Sparrow's Point.

Floating drydock No. 1, built by Bertelsen & Petersen Engineering Company as an addition to its plant on Border street, East Boston, was launched October 24. Although the dock is a small one, it will be an important adjunct to the equipment of the company in handling small craft. It is 120 feet long, 45 feet wide and capable of lifting 500 tons. It will be used in handling small schooners, trawlers, tugs, etc. The company plans the construction of a

large floating dock in the near future.

The Jahncke Ship Repair Company of New Orleans is negotiating for the purchase of the river front property occupied by the Jackson Barracks for proposed extensions to its plant.

M. Vogel, shipbuilder, of Milton Point, Long Island, is reported to have presented plans to the Miami, Florida, city commission for the establishment of a shipbuilding concern at that port.

The Lockport Dry Dock Company has been incorporated at Buffalo, New York, by B. L. and L. L. Cowles for \$5000. The new company will go in for general repairs to small vessels.

The Heinson Boat Building & Hauling Company of Manhattan has been incorporated under the laws of New York. The company will engage in boat building and general repair work and is represented by Cole & Robertson, 154 Nassau street, New York.

The new 15,000-ton drydock of the Portland Dock Commission was put in commission in November.

Yards Finish Work

The mortality among Pacific Coast shipyards during November was severe, no less than four plants completing their work, or expecting to complete it, during the month. With the delivery of the 11,000-ton freighter West Chopaka to the Shipping Board November 15, the Los Angeles Shipbuilding & Drydock Company finished its work and at the same time completed the last Shipping Board vessel building on the Pacific Coast. This vessel also was the last of any description launched, the combination Nutmeg State, building at Sparrows Point, Bethlehem, having been launched September 17, or two days prior to the West Chopaka. The last freighter to be delivered, however, will be the 10,000-ton Cathay, built at Kiangnan, Shanghai, which is scheduled to sail for the United States December 15, delivery to be made at a Pacific Coast port.

The Moore Shipbuilding Company delivered the 10,100-ton tanker Birkhead to the Vacuum Oil Company October 26 and the 4750-ton motor tanker H. T. Harper to the Standard Oil Company of California November 2, these vessels being the last under construction.

J. Coughlan & Sons, Vancouver, delivered the 8350-ton freighter Canadian Freighter, the last vessel building at the yard, to the Canadian Government Merchant Marine November 12. Her launching, which took place October 12, was the last

of any C. G. M. M. vessel, but apparently she will not be the last to be delivered.

The Wallace Shipbuilding & Drydock Company expected to deliver the combination vessel Princess Louise to the Canadian Pacific Railway November 30, and thus finish its building program.

With the delivery of the 7500-ton tanker La Purisima to the Union Oil Company October 20, the Southwestern Shipbuilding Company ended its work.

When the Coast Guard cutter Shawnee was launched by the Union Construction Company November 15, the ways of the entire Pacific Coast of the United States and Canada were cleared of sea-going vessels. Not one remained to be launched, although the Bethlehem Shipbuilding Corporation has under contract two 20,000-ton ore-and-coal vessels for the Ore Steamship Company, the keels of which have not been laid.

In the East the Davie Shipbuilding & Repairing Company wound up construction with the delivery of the C. G. M. M. Canadian Challenger October 27.

Repair Awards

Recent repair contracts are reported as follows: W. & A. Fletcher Company, Hoboken, engine repairs and general overhauling of Italian-American steamship William Ison. Robins Drydock & Repair Company (Todd), engine and boiler repairs U. S. S. B. Huron, \$21,900; repairs U. S. S. B. American Legion, \$14,980. Clinton Drydocks (Todd), installation of pumps and turbines New York City ferriboots James Duane and Thomas Willet, \$45,890. Morse Drydock & Repair Company, repairs steamship J. L. Luckenbach, recently sold to B. L. Stafford, Jr., and associates, about \$50,000. James Shewan & Son, overhauling nine ferriboots City of New York, \$14,935. Port Arthur Shipbuilding Company, overhauling and repairing steamship Francis Widlar, recently refloated from Pancake Shoals, Lake Superior, Standard Shipbuilding Corporation, repairs U. S. S. B. Buckeye State, \$19,000. Globe Shipbuilding & Drydock Company, replacing boilers, adding staterooms and installing steam heat and running water in Merchants & Miners' steamship Nantucket, about \$75,000. United Engineering Works, extensive repairs and alterations Matson steamship Lurline. Merchant Shipbuilding Corporation, addition of 'tween-deck to United American Line steamships Franklin and Fairmont; Standard Shipbuilding Corporation, repairs U. S. S. B. Centennial State, \$9520.

Warships to Be Scrapped

The following list gives the capital vessels to be scrapped under the armaments limitation proposal of Secretary Hughes, the yard at which each is building and the nature of the contract:

Newport News Shipbuilding & Drydock Company—West Virginia, Iowa, battleships, cost plus fee; Constellation, Ranger, battle-cruisers, cost plus fee.

Bethlehem Shipbuilding Corporation, Fore River Plant—Massachusetts, battleship, cost plus fee; Lexington, battle-cruiser, cost plus 10 per cent.

New York Shipbuilding Corporation—Colorado, Washington, battleships, cost plus 10 per cent; Saratoga, battle-cruiser, cost plus 10 per cent.

Navy Yard, New York—Indiana, South Dakota, battleships, limit of cost \$21,000,000.

Navy Yard, Norfolk—North Carolina, battleship, limit of cost \$21,000,000.

Navy Yard, Philadelphia—Constitution, United States, battle-cruisers, limit of cost \$23,000,000.

Navy Yard, Mare Island—Montana, battleship, limit of cost \$21,000,000.

Totals—Nine battleships and six battle-cruisers.

Of these vessels the battleships Colorado and Washington (New York Shipbuilding Corporation) and West Virginia (Newport News Shipbuilding & Drydock Company) have been launched.

The End of Faith

Named Faith; built in hope;—and sold for \$5100: such is the epitaph of the first seagoing concrete vessel of the world. If St. Paul were present he might be able to round out his trinity of cardinal virtues by some passing reference to the price; but he probably would decline, in view of the fact that the purchasers were junk dealers by the name of Marx, who might resent any soft impeachment of charity.

The forced sale of the Faith at New Orleans will be accepted generally as closing a curious, even unique episode of shipbuilding. She was not the only concrete steamship built in the United States, for the Shipping Board laid down some 7500-ton tankers during the feverish days of 1918, and other "stone" ships were poured here and there; but the Faith remains, nevertheless, the prototype, and her humiliating end must be accepted as that of all. Her original cost is reported to have been \$750,000; she was sold three years ago

by the San Francisco Shipbuilding Company for \$600,000, according to a statement of her last crew; and now her value as a seagoing vessel is practically nothing, although it is true that she was put up at auction at a time when even new steel steamships were a drag on the market.

In Bad Odor

The Faith's crew claimed about \$20,000 in wages; the Armour fertilizer works added \$40,180.96 for damage to a cargo of bones. Forty days prior to the sale, the United States marshal was offered \$20,000, but declined because the Armour company protested on the ground that such a sum would be devoured by the seamen. The Faith's last voyage was from New Orleans to Buenos Aires and return. On that voyage the crew received no pay, according to the libel, and had difficulty in getting enough to eat.

Aside from the cargo of bones, deadweight was the undoing of the

concrete ship. Despite the natural fear as to seaworthiness (a fear that appears now to have been groundless); despite the many and varied jokes that went the rounds, the Faith and her sisters might have appealed to shipowners if their actual weight had not been altogether out of proportion to their carrying capacities. For example, the concrete tankers Peralta and Palo Alto, delivered to the Shipping Board in 1920, are of 7500 tons deadweight and 3700 net, whereas a new steel tanker, La Purissima, built for the Union Oil Company by the Southwestern Shipbuilding Company, has the same deadweight but only 3032 net tonnage. In short, the concrete tankers are 25 per cent larger, with all that implies as to tonnage and canal dues and so on, without having capacity for transporting a single ton more of oil.

R. I. P., for the Faith; and that's what the junk dealers probably will do.

Reports of the Yards

Pacific Launchings UNITED STATES

W. S. Rheem, tanker Standard Oil Company of California, Bethlehem Shipbuilding Corporation, Alameda Works, October 28.

Shawnee, tug United States Coast Guard, Union Construction Company, November 15.

Perry, destroyer U. S. N., Mare Island Navy Yard, October 29.

Decatur, destroyer U. S. N., Mare Island Navy Yard, October 29.

Pacific Deliveries UNITED STATES

West Chopaka, freighter U. S. S. B., Los Angeles Shipbuilding & Drydock Company, November 14.

H. T. Harper, tanker Standard Oil Company of California, Moore Shipbuilding Company, November 2.

Birkenhead, tanker Vacuum Oil Company, Moore Shipbuilding Company, October 26.

Wasmuth, destroyer U. S. N., Mare Island Navy Yard, November 10.

CANADA

Canadian Freighter, freighter C. G. M. M., J. Coughlan & Sons, November 12.

Eastern Launchings UNITED STATES

Fireboat City of Philadelphia, Bethlehem Shipbuilding Corporation, Baltimore Drydocks Plant, October 22.

President Roosevelt, ferryboat City of New York, Staten Island Shipbuilding Company, November 5.

Lightship bureau of lighthouses,

President Roosevelt, ferryboat City of New York, Staten Island Shipbuilding Company, November.

CANADIAN

Canadian Challenger, freighter C. G. M. M., Davie Shipbuilding & Repairing Company, October 27.

Canadian Logger, freighter C. G. M. M., Midland Shipbuilding Company, October 12.

Pacific Coast, United States

BETHLEHEM SHIPBUILDING CORPORATION, LTD.

Potrero Works

Purchasing Agent: O. W. Street.
Submarines USN: S-31, hull 136; S-32, hull 137; S-33, hull 138; S-34, hull 139; S-35, hull 140; S-36, hull 141; S-37, hull 142; S-38, hull 143; S-39, hull 144; S-40, hull 145; S-41, hull 146; all launched; outfitting proceeding slowly.

Alameda Works

Chilore, hull 5309, combination ore and coal carrier Ore Steamship Co; 571-6 LOA; 550-1 LBP; 72 molded beam; 44 molded depth; 32-4 loaded draft; 11½ loaded speed; 20,000 DWT; Curtiss turbines with Falk reduction gears, 5000 SHP; 3 Scotch SE boilers, 17-6x12, each 4287 sq ft; oil burners.

Lebore, hull 5310, combination ore and coal carrier Ore Steamship Co; sister to above.

H. M. Storey, hull 5312, tanker Stand Oil Co of Cal; 500 LBP; 68 beam; 25-11 loaded draft; 11 loaded speed; 15,000 DWT; rec engs, 4000 IHP; 3 Scotch marine boilers, 16x 12-9; keel Jan 19/21; launch Sept 28/21; deliver Dec 5/21, est.

W. S. Rheem, hull 5313, tanker Stand Oil Co of Cal; sister to above; keel Mar 1/21; launch Oct 28/21; deliver Dec 31/21, est.

No name, hull 5314, ferryboat Six Minute Ferry Co; 230 LOA; 63-6 beam over guards, 42 molded; 19-6 molded depth; TE eng, 1400 IHP; propeller drive; 3 WT boilers; keel Aug 27/21.

No name, hull 5315, ferryboat Six Minute Ferry Co; sister to above.

HANLON DRYDOCK & SHIPBUILDING CO., OAKLAND

Purchasing Agent: R. Barker.
Dan F. Hanlon, hull 89, steam schr. D. J. Hanlon; 2500 DWT; 1400 IHP engines; 2 B&W boilers; work suspended.

LOS ANGELES SHIPBUILDING & DRYDOCK CO., SAN PEDRO

West Chopaka, hull 35, steel cargo USSB; 430 LBP; 54 beam; 28-2 loaded draft; 10½ loaded speed; 11,000 DWT; TE engs, 3500 IHP; 3 Scotch single end, 15-9; keel Feb 24/21; launch Sept 19/21; deliver Nov 14/21.

MOORE SHIPBUILDING COMPANY, OAKLAND

Purchasing Agent: W. E. Hostetter.

Consolidated Shipbuilding Corporation, November 16.

Steel Seafarer, freighter United States Steel Products Company, Federal Shipbuilding Company, October 18.

Steel Pathfinder, freighter United States Steel Products Company, Federal Shipbuilding Company, November 17.

Californian, motorship, freighter American-Hawaiian Steamship Company, Merchant Shipbuilding Corporation, November 14.

West Virginia, battleship U. S. N., Newport News Shipbuilding & Drydock Company, November 19.

Wm. Rockefeller, tanker Standard Oil Company of New Jersey, Newport News Shipbuilding & Drydock Company, October 5.

Tanker, builder's account, Texas Steamship Company, November 19.

Eastern Deliveries

UNITED STATES

Pine Tree State, combination U. S. S. B., Bethlehem Shipbuilding Corporation, Sparrow's Point Plant, November 3.

Samuel Q. Brown, tanker Tidewater Oil Company, Merchant Shipbuilding Corporation, November 5.

Wm. Rockefeller, tanker Standard Oil Company of New Jersey, Newport News Shipbuilding & Drydock Company, November 9.

Levant Arrow, tanker Standard Transportation Company of New York, New York Shipbuilding Corporation, October 18.



H. T. Harper, hull 163, tanker Standard Oil Co of California; 330 LBP; 46 beam; 21-6 loaded draft; 4750 DWT; Skandia Diesel engs; keel Oct/20; launch June 16/21; deliver Nov 2/21.

Birkenhead, hull 166, tanker for Vacuum Oil Co; 425 LBP; 67 beam; 26-3 loaded draft; 10,100 DWT; 2x engs; 3 Scotch marine boilers, 15-2x 12; keel Dec 9/20; launch July 9/21; deliver Oct 26/21.

NAVY YARD, PUGET SOUND

Medusa, repair ship for government; 460 LBP; 70 beam; about 19 loaded draft; 17-5 loaded speed; turbine eng, 7000 IHP; 2 WT express type boilers; 10,000 tons disp; keel Jan 2/20; launch and deliver dates not set.

Holland, submarine tender for government; 460 LBP; 61 beam; about 20 loaded draft; 16 K loaded speed; turbine eng, 7000 IHP; two WT express type boilers; 10,000 tons disp; keel April 1/21.

NAVY YARD, MARE ISLAND

Montana, battleship USN; 660 LB P; 105 beam; 33 loaded draft; 23 loaded speed; 42,200 disp; turbo-electric engs, 60,000 SHP; 12 Bu's express boilers, 74,040 sq ft; keel Sept 1/20; work suspended.

Wasmuth, destroyer USN; 310 LB P; 30-11½ beam; 9-4 loaded draft; 35 loaded speed; 1215 disp; geared turbine eng, 26,000 SHP; 4 Normand boilers, 27,000 sq ft; keel Aug 12/19; launch Sept 15/20; commission Nov 10/21.

Trevor, destroyer USN; 310 LB P; 30-11½ beam; 9-4 loaded draft; 35 loaded speed; 1215 disp; geared turbine eng, 26,000 SHP; 4 Normand boilers, 27,000 sq ft; keel Aug 12/19; launch Sept 15/20.

Perry, destroyer USN; sister to above; keel Sept 15/20; launch Oct 29/21.

Decatur, destroyer USN; sister to above; keel Sept 15/20; launch Oct 29/21.



Keystone Photo Service

The gentleman grasping the Jacob's ladder with such meticulous care is E. E. Remberg, Los Angeles agent of the Shipping Board and brother-in-law to President W. G. Harding. Mr. Remberg intended to board the Shipping Board freighter West Chopaka before she cast off from the wharf of the Los Angeles Shipbuilding & Drydock Company on her trial trip, but he missed the sailing, and a tug of the Los Angeles yard put him aboard. The gentleman watching Mr. Remberg's struggles from a safe place on deck and smiling fondly is Fred L. Baker, president of the yard.

The West Chopaka, with her propeller half out of the water, made more than 13 knots over a measured course off Los Angeles Harbor. She was the thirty-fifth and last steel freighter built by the Los Angeles Shipbuilding & Drydock Company, was the last to be launched of the entire Shipping Board freighter program, and except for the 10,000-ton Cathay, built in Shanghai, was the last to be delivered.

TODD DRYDOCK & CONSTRUCTION CORP., TACOMA

Purchasing Agent: C. L. Bankson. Omaha, hull 100, scout cruiser USN; 555-6 LOA; 550 LBP; extreme beam 55-4; molded beam 54-9; depth molded 26; mean loaded draft 13-6; disp 7100 tons; Westinghouse Parsons turbines and reduction gear, 105,000 IHP; designated speed 34; 12 Yarrows WT boilers; keel Dec 6/18; launch Dec 14/20.

Milwaukee, hull 106, scout cruiser USN; sister to above; keel Dec 13/18; launch Mar 24/21.

Cincinnati, hull 107, scout cruiser USN; sister to above; keel May 15/20; launch May 23/21.

UNION CONSTRUCTION CO., OAKLAND

Purchasing Agent: A. J. Farnsworth.

Mojave, hull 18, cutter USCG; 240 LOA; 39 beam; 14 loaded draft; 16 loaded speed; 1600 DWT; turbo-electric engs, 2600 IHP; 2 WT boilers; keel April 6/21; launch Sept 7/21; deliver Dec 1/21, est.

Modoc, hull 19, cutter USCG; same as above; keel April 9/21; launch Oct 1/21; deliver Dec 15/21, est.

Shawnee, hull 20, cutter USCG; 150 LOA; 30 beam; 13-6 loaded draft; 12½ loaded speed; 1000 DWT; rec engs, 1000 IHP; 2 WT boilers; keel June 1/21; launch Nov 15/21.

Canadian

CHOLBERG SHIPYARD, VANCOUVER, B. C.

Purchasing Agent: W. Meed. (These vessels to be completed by Dominion government.)

Sir Henry Drayton, hull 5, 4-masted barkentine Victoria Shipowners, Ltd; 250 LOA; 45-6 beam; 21-10 loaded draft; 2400 DWT; sailing vessel; shaft logs fitted for auxiliary but no machinery installed; keel May 15/20.

No name, hull 6, 4-masted barken-

tine Victoria Shipowners, Ltd; sister to above; keel June4/20.

No name, hull 7, 4-masted barkentine Victoria Shipowners, Ltd; sister to above; keel Feb/21.

J. COUGHLAN & SONS, LTD. VANCOUVER, B. C.

Purchasing Agent: J. Joseph.

Canadian Freighter, hull 21, steel freighter Canadian government; 400 LBP; 52 beam; 25-3 loaded draft; 11½ loaded speed; 8350 DWT; TE eng, 3000 IHP; 3 Scotch boilers, 15-6 x11-6; keel Jan6/21; launch Oct12/21; deliver Nov12/21.

PRINCE RUPERT DRYDOCK & ENGINEERING COMPANY PRINCE RUPERT

Canadian Britisher, steel cargo Canadian government; 8390 DWT; 2-deck; bridge, poop and forecastle; 11 speed; keel Oct20/19; launch Oct 6/21.

This vessel is being completed by the Wallace Shipbuilding & Drydock Co, North Vancouver. The terms are time and material plus 8 per cent.

WALLACE SHIPBUILDING & DRYDOCK CO., VANCOUVER, B. C.

Princess Louise, Canadian Pacific; 317 LBP; 48 beam; 180½ deep; 16 knots; single-screw; 600 tons cargo space; accommodations for 200 passengers; keel Oct/20; launch Aug 29/21; deliver Nov30/21, est.

Atlantic and Gulf

AMERICAN BRIDGE COMPANY, PITTSBURGH, PENN.

Purchasing Agent: W. G. A. Millar.

Twenty-five coal barges Carnegie Steel Co; 175 LBP; 26 beam; 8 loaded draft; 20 launched.

Two tow boat hulls Carnegie Steel Co; 149-2x34 4-5 loaded draft; launch and deliver Jan/22, est.

Two coal barges, 175 LBP; 26 beam; 8 loaded draft; undisclosed interests.

Fifteen decked barges, 120 LBP; 30 beam; 7 deep; US Engineers, Memphis, Tenn.

Two decked barges, undisclosed interests, 150x32x7-6; launch Mar/22, est.

BETHLEHEM SHIPBUILD'G CORPORATION, BALTIMORE, DRYDOCKS PLANT, BALTIMORE

A. C. Crosby, assistant general manager in charge of purchases.

Hull 125, tanker builder's account; 340 LBP; 49 beam; 23-6 loaded draft; 10 loaded speed; 6000 DWT; rec. eng, 2000 IHP; 2 Scotch boilers, 15-3; keel Nov24/20.

Hull 126, tanker builder's account; 430 LBP; 59 beam; 25-4½ loaded draft; 10 loaded speed; 10,250 DWT; turb eng, 3000 IHP; 3 Scotch boilers, 15-3; keel Sept27/20.

Hull 128, fireboat City of Baltimore; 115-6 LBP; 28 beam; 9-6 load-

ed draft; 12 loaded speed; rec eng, 1000 IHP; 2 B&W WT boilers; keel July15/21; launch Oct22/21.

BETHLEHEM SHIPBUILDING CORP., FORE RIVER PLANT, QUINCY, MASS.

Lexington, hull 1300, battle-cruiser US N.

Raleigh, hull 1382, scout cruiser US N.

Detroit, hull 1383, scout cruiser US N.

Massachusetts, hull 1400, battle-ship US N.

And the following nineteen submarines US N: AA-2, hull 1270; hulls 1309 to 1320 inc, submarines S-18 to S-29 inc; hulls 1389 to 1394 inc; submarines S-42 to S-47 inc.

J. Fletcher Farrell, hull 1496, tanker Sinclair Nav Co; 430 LBP; 59 beam; 25-5 loaded draft; 11 loaded speed; 10,600 DWT; rec eng, 3200 IHP; 3 Scotch boilers, 15x11-9; launch June10/21.

William Boyce Thompson, tanker Sinclair Nav Co; sister to above; keel Nov11/21; launch July/21.

BETHLEHEM SHIPBUILDING CORP., HARLAN PLANT, WILMINGTON, DEL.

No name, hull 3477, tanker Atlantic Refining Co; 226 LBP; 39 beam; 17 loaded draft; 8½ loaded speed; 2600 DWT; turb eng, 750 IHP; B & W boilers; keel Aug/20.

BETHLEHEM SHIPBLDG. CORP., SPARROWS POINT PLANT, SPARROWS POINT, MD.

Pine Tree State, hull 4196, combination USSB; 518 LBP; 72 beam; 30-7 loaded draft; 16 loaded speed; turb eng, 10,000 IHP; 8 Yarrow boilers; keel Feb15/19; launch Mar 19/21; deliver Nov3/21.

Palmetto State, hull 4196; combination USSB; sister to above; keel Feb19/19; launch June4/21.

Nutmeg State, hull 4197, combination USSB; sister to above; keel July29/20; launch Sept17/21.

Bethore, hull 4211, ore and oil Ore SS Co; 550 LBP; 72 beam; 32-4 loaded draft; 11½ loaded speed; 20,000 DWT; rec eng, 4600 IHP; 3 Scotch boilers, 17-6x12; keel Feb 24/21.

Marore, hull 4212, ore and oil Ore SS Co; sister to above, except turb eng; keel May2/21.

Steeleore, hull 4213, ore and oil Ore SS Co; sister to above; keel July 20/21.

CONSOLIDATED SHIPBUILDING CORPORATION, MORRIS HEIGHTS, N. Y.

Purchasing Agent: Bruce Scrimgeour.

No name, hull 246, US lightship; 146-3 LOA; 30 beam; 12-7 loaded draft; 825 DWT; comp eng, 400 IH

P; 2 Scotch boilers, 10-6 diam; keel Mar4-21; launch Nov16/21.

WILLIAM CRAMP & SONS SHIP & ENGINE BUILDING CO., PHILADELPHIA

Purchasing Agent: Ed. C. Gehr. (Work held up)

Richmond, hull 448, scout cruiser USN; keel Feb16/20; launch Sept 29/21; 78 per cent comp. Nov 1.

Concord, hull 449, scout cruiser USN; keel Mar29/20; 71 per cent comp Nov 1.

Trenton, hull 501, scout cruiser USN; keel Aug18/20; 52 per cent comp Nov 1.

Marblehead, hull 502, scout cruiser USN; keel Aug4/20; 47 per cent comp Nov 1.

Memphis, hull 503, scout cruiser USN; keel Oct14/20; 40 per cent comp Nov 1.

OSCAR DANIELS COMPANY, TAMPA, FLORIDA

B. D. Benson, hull 11, Isherwood tanker Standard Oil; 466 LBP; 60 beam; 26-7 loaded draft; 10½ loaded speed; 11,900 DWT; QE eng, 2800 IHP; 3 Scotch boilers, 15x11-6; keel June29/20; launch Sept5/21.

FEDERAL SHIPBUILDING CO., KEARNY, N. J.

Purchasing Agent: J. L. Hastings.

Steel Seafarer, hull 43, freighter US Steel Products Co; 425 LBP; 56 beam; 25-10 loaded draft; 12 loaded speed; 9400 DWT; turb engs, 3100 IHP; 3 Scotch boilers, 15 diam; keel May25/21; launch Oct18/21.

Steel Pathfinder, hull 44, freighter US Steel Products Co; sister to the above; keel June1/21; launch Nov 17/21.

Steel Pioneer, hull 45, freighter US Steel Products Co; sister to the above; keel July/21; launch Dec10/21, est; deliver Dec31/21, est.

LAKE TORPEDO BOAT CO., BRIDGEFORD, CONN.

Purchasing Agent: C. D. Maxfield.

S-48, hull 48, submarine USN; launch Feb26/21.

S-49, hull 49, submarine USN; launch Apr23/21.

S-50, hull 50, submarine USN; launch June18/21.

S-51, hull 51, submarine USN; launch Aug20/21.

MERCHANT SHIPBUILDING CORPORATION, CHESTER, PENN.

Vice-President: J. L. Ackerson. Samuel Q. Brown, hull 584, tanker Tidewater Oil Co; 424 LBP; 58 beam; 25-5 loaded draft; 10½ loaded speed; 10,000 DWT; TE engs; 3 Scotch boilers, 15-3x11-7; keel Oct 1/20; launch Oct16/21; deliver Nov 5/21.

Californian, hull 385, freighter American-Hawaiian SS Co; 445 LBP; 59-8 beam; 28-6 loaded draft; 11½ speed; 11,000 DWT; 2 6-cyl, 4-cycle Diesel engs, 4500 metric; 1 vertical donkey, 400 sq ft HS; keel Feb5/21; launch Nov14/21.

Missourian, hull 386, freighter American-Hawaiian SS Co; sister to above; keel Feb10/21; launch Nov 28/21, est.

No name, hull 387, fireboat City of Philadelphia; 120-9 LOA; 28 beam; 12-9 deep; 9 loaded draft; comp eng, 500 IHP; 2 B&W WT boilers, oil; 4 turbine fire pumps, 1 30-foot tower, 2 15-foot towers; capacity 12,000 gals a minute; keel Sept 15/21; launch Nov/21, est.

NAVY YARD, BOSTON

Whitney, destroyer tender No. 4 USN; 460 LBP; 60-11 beam; 21 normal draft; 16 loaded speed; 10,600 normal disp; geared Parsons turbs, 7000 SHP; 2 WT exp small tube boilers; keel Apr23/21; launching indefinite.

NAVY YARD, PHILADELPHIA

(All work practically suspended since July 1/21.)

Dobbin, hull 7, destroyer tender USN; 460 LBP; 60-10 beam; 21 loaded draft; 16 loaded speed; 10,600 tons disp; Parsons geared turb single screw engs, 7000 SHP; 2 WT boilers; keel Dec23/19; launch May 5/21; deliver date not determined.

Constitution, hull 8, battle cruiser USN; 850 LBP; 105-4 beam; 30-11½ loaded draft; 33½ loaded speed; 43,500 disp; electric drive, 180,000 SHP; 16 WT boilers; keel Sept 25/20; launch and deliver dates not determined.

United States, hull 9, battle cruiser USN; 850 LBP; 105-4 beam; 30-11½ loaded draft; 33½ loaded speed; 43,500 disp; electric drive, 180,000 SHP; 16 WT boilers; keel Sept 25/20; launch and deliver dates not determined.

NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY, NEWPORT NEWS

Purchasing Agent: James Plummer, 233 Broadway, New York City. West Virginia, hull 211, battleship USN; 600 LBP; 97-3½ beam; 21 mean draft; 32,600 normal disp; GE turbo-electric drive, 28,900 SHP; 8 B&W WT boilers, oil, 41,768 sq ft plus 4168 superheat; keel Apr 12/20; launch Nov/21.

Constellation, hull 215, battle-cruiser USN; 850 LBP; 101-8½ beam; 31 mean draft; 43,500 normal disp; 33½ speed, est; Westinghouse turbo-elec drive, 180,000 SHP; 16 WT boilers, oil, 198,000 sq ft plus 18,000 superheat; keel Aug18/20.

Ranger, hull 215, battle-cruiser USN; sister to above; keel June23/21.

Iowa, hull 258, battleship USN; 660 LBP; 105 beam; 33 mean draft; 43,200 normal disp; 23 speed; GE turbo-elec drive, 60,000 SHP; 12 White-Forster WT boilers, oil, 82,800 sq ft plus 8940 superheat; keel May17/20.

Wm. Rockefeller, hull 262, tanker Standard Oil NJ; 555 LBP; 75 beam; 30 loaded draft; 10½ loaded speed; 20,300 DWT; twin screw, TE eng,

3800 IHP; 3 Scotch boilers, 17x12; keel Dec15/20; launch Oct5/21; deliver Nov9/21.

No name, hull 263, Diesel yacht Cox & Stevens; 180-6 LOA; 24 beam; 14 deep.

NEW YORK SHIPBUILDING CORPORATION, CAMDEN, N. J.

Purchasing Agent: L. G. Buckwalter.

Bay State, hull 251, combination USSB; 534 LBP; 72 beam; 30-6 loaded draft; 18 loaded speed; 11,000 D WT; geared turbs, 12,000 SHP; 8 WT boilers; keel Oct15/19; launch July17/20; deliver winter/21, est.

Peninsula State, hull 252, combination USSB; sister to above; keel July20/20; launch July6/21; deliver spring/22, est.

Lone Star State, hull 255, combination USSB; sister to above; keel May 13/19; launch Oct23/20; deliver fall/21, est.

Levant Arrow, hull 262, bulk oil Standard Trans Co of NY; 468 LBP; 62-6 beam, 27-0¼ loaded draft; 10½ loaded speed; 12,550 DWT; 4 cyl QE engs, 3200 SHP; 3 SE Scotch boilers, 15-2x11-6; keel Nov4/20; launch July25/21; deliver Oct18/21.

Munargo, hull 263, combination Munson SS Co; 414 LBP; 57-6 beam; 23 loaded draft; 15½ loaded speed; 4,950 DWT; geared turbs, 5800 SHP; 5 SE Scotch boilers, 16-4x12-3; keel Sept30/21; launch Sept17/21; deliver winter/21, est.

Eurana, hull 264, bulk oil stock; 419-3 LBP; 56-3 beam; 25-9¼ loaded draft; 10½ loaded speed; 9870 DWT; 3 cyl TE engs, 3000 SHP; 3 SE Scotch boilers, 15-10x11-4; keel Jan17/21; launch July16/21; deliver winter/21.

No name, hull 265, bulk oil stock; sister to above.

Dixie Arrow, hull 266, bulk oil Standard Trans Co of NY; 468 LBP; 62-6 beam; 27-0¼ loaded draft; 10½ loaded speed; 12,550 DWT; 4 cyl QE engs, 3200 SHP; 3 SE Scotch boilers, 15-3x11-6; keel Aug1/20; launch Sept29/21; deliver winter/21, est.

Saratoga, hull 199, battle cruiser USN; 874 LOA; 850 LBP; 105-5¼ extreme beam; 31 mean draft; 43,500 normal disp; 33½ loaded speed; GE turbo-electric drive, 180,000 SHP; 16 WT boilers, 198,000 sq ft plus 18,000 superheat; keel Sept25/20.

Colorado, hull 200, battleship USN; 624 LOA; 600 LBP; 97-3½ beam waterline; 30-6 mean draft; 32,600 normal disp; 21 loaded speed; Westinghouse turbo-electric drive, 28,900 SHP; 8 B&W WT boilers, 41,678 sq ft plus 4169 superheat; keel Mar29/19; launch Mar22/21.

Washington, hull 201, battleship USN; sister to above; keel June30/19; launch Sept1/21.

Kamo, hull 267, fuel ship Japanese Navv; 497-8 LOA; 67 beam; 28 designed draft; 15 loaded speed; 13,000 DWT; elec drive, 8000 SHP; 4 B&W boilers; keel Sept14/21.

STANDARD SHIPBLDG. CORP'N, SHOOTERS ISLAND, MARINERS HARBOR, N. Y.

Purchasing Agent: Jamie Cortada. John Purroy Mitchell, hull 32, fireboat City of New York; 121 LBP; 27 beam; 14-9 deep; 12 loaded speed; comp eng, 900 IHP; 2 B&W WT boilers, oil burning; keel Mar31/21; launch Aug6/21.

STATEN ISLAND SHIPBUILDING COMPANY, STATEN ISLAND, NEW YORK

Purchasing Agent: R. C. Miller. Hell Gate, hull 728, dredge V. R. Browning; 140 LBP; 48 beam; 15 loaded draft; keel Aug28/20; launch Feb23/21.

Hull 736, tugboat Staples Trans Co; 136½ LBP; 27 beam; 16½ loaded draft; 10 loaded speed; 1 TE eng 700 HP; 1 Scotch boiler, 16x11½; keel May16/21; launch Aug4/21.

President Roosevelt, hull 737, ferryboat City of New York; 247 LBP; 66 beam; 19½ loaded draft; 15 loaded speed; 1 F&A comp eng, 3500 HP; 4 B&W WT boilers, 13,000 sq ft; keel May23/21; launch Nov5/21; deliver Nov/21.

SUN SHIPBUILDING COMPANY, CHESTER, PENN.

Purchasing Agent: H. W. Scott. Agwiscot, hull 42, tanker A. G. W. I. S. Co; 480 LBP; 65-9 beam; 26-7 loaded draft; 12 loaded speed; 12,500 DWT; single screw QE engs, 4300 IHP; 4 SE Scotch boilers, 15-10x11-1¼; keel Dec23/20.

Agwistates, hull 43, tanker A. G. W. I. S. Co; sister to above; keel Jan3/21.

No name, hull 46, tanker Sun Oil Co; 480 LBP; 65-9 beam; 26-7 loaded draft; 10½ loaded speed; 12,800 DWT; single screw QE engs, 4300 IHP; 3 SE Scotch boilers, 15x11-1¼; keel not laid.

No name, hull 47, tanker Sun Oil Co; sister to above; keel not laid.

TEXAS STEAMSHIP COMPANY, BATH, MAINE

Purchasing Agent: A. R. Weber. No name, hull 32, tanker Texas SS Co; 415-10 LBP; 56 beam; 25-7¼ loaded draft; 11½ loaded speed; 9600 DWT; TE engs, 3000 IHP; 3 Scotch boilers, 15-3x11; keel Nov 9/20; launch Nov19/21.

Canadian

DAVE SHIPBUILDING & REPAIRING COMPANY, LTD., LAUZON LEVIS, P. Q., CANADA

Purchasing Agent: N. W. Van Wyck.

Canadian Challenger, hull 476, single-screw cargo Canadian government; 400 LBP; 52 beam; 25-3 loaded draft; 11½ loaded speed; 8350 D WT; TE surface cond engs, 3000 I HP; 3 Scotch marine boilers, 15-6x11-6; keel May14/20; launch July 7/21; deliver Oct27/21.

NOVA SCOTIA STEEL & COAL CO., TRENTON, N. S.

Purchasing Agent: A. M. Seely.
Sea King, hull 9, exploring yacht
Baron Bliss, Nassau, Bahamas; 137-
10 LBP; 28-6 beam; 6 loaded draft;
7 loaded speed; semi-Diesel 440 BH
P. twin-screw eng; keel Aug 24/20.

Miscellaneous Construction

The American Engineering Company has received orders for the following:

One size "F" towing machine with auxiliary warping heads, electric drive, for fuel oil supply for the Imperial Japanese Navy, now building at the New York Shipbuilding Corporation, Camden, New Jersey.

Steering gears for the ice boat Annapolis, City of Baltimore.

Windlasses for a new yacht being built by Henry J. Gielow, also for an electric windlass for a vessel being constructed in Tebo Yacht Basin, Brooklyn, New York.

The Moore Plant of the Bethlehem Shipbuilding Corporation will construct the deck machinery for a 2650-ton tanker for the Atlantic Refining Company, which is to be built by the Harlan Plant. This machinery will consist of a 7 by 7 inch Bethlehem spring quadrant type steering gear with horizontal engines, an 8 1/4 by 8 inch Bethlehem spur gear windlass suitable for taking 1 1/2 inch anchor chain, and a 6 1/4 by 8 inch Bethlehem steam self-contained gyroscope.

The Augusta, Gardiner & Boothbay Steamboat Company has placed an order with the Kearsfott Engineering Company, Inc., of New York City for new machinery for the river boat Virginia.

It is understood that an export order has been placed with the Kearsfott Engineering Company, Inc., 95 Liberty street, New York, for an engine and boiler room equipment for a tugboat. The boat is quite similar to the 100-foot harbor tugs built in this country for the Shipping Board.

Drydocking and Repairs

BETHLEHEM SHIPBUILDING CORPORATION

Sparrow's Point Plant

Conversion from coal to oil burning; Fort St. George, Furness Withy & Co. Alterations to stern: Iowan, United American Lines.

UNION PLANT

Alameda Works

Engine, boiler, hull repairs, drydocking, painting; Raymond, Chas. Christensen. Miscellaneous repairs: Daisy Freeman. New propeller: Claremont, Solano, Mayfair. Miscellaneous repairs, drydocking, painting: Vanguard, Ramon, Cypress, Mojave, Trinidad (also repairs to boiler seatings).

Potrero Works

Miscellaneous repairs: Walkure, Edgar Luckenbach, Utility, Fluto, Nanking, Coquille, River, Lurline, Victoria de Larrinaga (also repairs to chocks), La Purisima, Frank G. Drum, Spectator. Miscellaneous repairs, drydocking, painting: Tascalus, Tatoosh, Hollywood, Sinaloa (also hull damage repairs), Eviken. Making and installing deck lashings: Canada. Retubing boilers, repairs to blower engine: Buckeye State. Hull damage repairs, drydocking, painting: Rose City. Engine, boiler, hull repairs, drydocking, painting: Manoa. Remetalling bearings: Honduras. Repairs to cargo pump: Olinda. Repairs to steering gear: Pomona. Engine, boiler, hull repairs: Italian cruiser Libia. Alterations to propeller: Sylvan Arrow.

LOS ANGELES SHIPBUILDING & DRYDOCK COMPANY, SAN PEDRO

Drydocking, cleaning, painting: Chase No. 323, R-7, Mervine No. 322, R-4, Hull No. 330, Summer No. 333, R-3, R-5, R-8, Farenholt No. 332, MacDonald No. 331, H-6 H-8, H-5, H-7. Repairs to anchor windlass and refrigerating system: Sierra. Docking, painting, tailshaft, stern tube, minor repairs: Whittier. Minor repairs: Pacific, Samson, Daisy Putnam, Protector, Catherine C. Sudden, Humanity, Pacific, Edna (on main engine), Robin Adair. Boiler repairs: Cold Harbor. Generator repairs, Willhilo. Minor welding job, cargo door: Yale. Docking, painting, new propeller: Henrietta. Condenser and turbine repairs: K. I. Luckenbach. Docking, painting, propeller, stern tube, boiler repairs: Springfield. Emergency repairs to hull: Thomas Crowley.

MERCHANT SHIPBUILDING CORPORATION, CHESTER, PENNSYLVANIA

Conversion from colliers to freighters: Franklin, Fairmont, United American Lines.

MOORE SHIPBUILDING COMPANY, OAKLAND

Drydocking, cleaning, painting, hull repairs: General McDowell, La Merced, Northland. Drydocking, cleaning, painting, engine repairs: Edward T. Jeffrey, Mayfair. Drydocking, cleaning, painting: Asbury Park (also wheel work), Haida, Wellington, Catherine Sudden. Rotarian (deck repairs), Seaward. Deck repairs: West Inslip, W. P. Barge No. 2-G, S. J. Luckenbach. Engine repairs: Santa Rita, Munaries, Ensley City, Newport, Matsonia, Oriental, Manukai, Buford, Lightship Madrona. New propeller blades: Seabree. Drydocking, painting, cleaning, hull, engine repairs: Venezuela, Royal Arrow. New propeller, Shabone.

NAVY YARD, PUGET SOUND

Docking, miscellaneous repairs: Ballard, Laub, McAnahan, Shu-

brick, Greene, Philip, Nitro, Coal barge No. 467, 100-ton Crane, Iroquois, Subchasers No. 301, 295. Docking and minor repairs: Sinclair, Keystone State. Miscellaneous repairs: Swallow, John Francis Burnes, Wickes, Evans, Buchanan, Aaron Ward, Zeilin. Repairs to cable machinery: Burnside. Miscellaneous repairs incident to operation as district craft: Eagle No. 57, Pawtucket, Sotoyomo, Mahopac, Tatnuck. Care and preservation: Oregon, Seattle, Missoula, Charlotte, S. C. No. 310.

TODD DRY DOCKS, INC., SEATTLE

Rudder repairs: Edmore. Docking, cleaning, painting, miscellaneous repairs: West Ison, Durand. Miscellaneous repairs: Sam'l Ringgold, Talthybius, Washington, Burrard, President. Voyage repairs: Colusa. Survey and temporary repairs: Lubrico. Miscellaneous betterments: Wenatchee. Miscellaneous repairs and betterments, also new accommodations in steerage quarters: Keystone State. Survey and hull repairs: Admiral Watson. Hull repairs: Arizonan. Conversion into ferry: Whatcom. Cleaning, painting: Washtucna, Restorer, Pico, Kennecott, Petroleum II, Forest T. Crosby. Repairs to elevator: Bailey Gatzert. Repairs to main feed line: Mexican.

WINSLOW MARINE RAILWAY & SHIPBUILDING CO., INC. SEATTLE

Engine and oil burner repairs: Anyox. Drydocking, cleaning, painting: Russell Haviside (also minor plank repairs), Bainbridge (also hull repairs), Montreccio (also unshipping rudder), Meriden, Nottingham (also overhauling and replacing 16 strakes both sides). Drydocking, engine repairs: Griffdu, Griffco, Fulton.

The Greatest Fleet

When the new 20,300 deadweight ton tanker Wm. Rockefeller was delivered to the Standard Oil Company of New Jersey by the Newport News Shipbuilding & Drydock Company in November, the Standard of New Jersey's great building program came to an end. It now has 66 seagoing vessels of 641,259 deadweight tons, the largest privately-owned fleet under the American flag and the largest single tanker fleet in the world. On the Pacific Coast the Standard Oil Company of California, with 41 vessels of 165,000 deadweight tons, leads privately-owned shipping. Its building program is not complete, however, two vessels of 15,000 deadweight tons, which are included in the total, remaining to be delivered.

The Wm. Rockefeller and sister, the John D. Archbold, are the largest tankers of the world.

The First Tanker

In this connection the following

item from the Chester Compass, published by the Merchant Shipbuilding Corporation, will be of interest:

M. R. MacDowell was in charge of building the first steamer in the United States to carry oil in bulk. This steamer was built at the John Roach Yard about thirty-five years ago. She was owned by the Standard Oil Company, and was named the Standard. Her engines and boilers have been removed, but she is still in use as a barge.

He also built for the same company barges No. 57 and No. 58, some thirty-two years ago, both of which are still in commission.

Oil Carriers Feared

About the same time that barges No. 57 and No. 58 were built, he also made very extensive repairs to the steamer Maverick, which was built in Baltimore and found to be leaking very badly on her maiden trip from Point Breeze to Boston. Insurance companies in those days would not permit a vessel to be tied up at the wharf that had carried oil; therefore, it was necessary for repairs to be made in midstream. After this work was done, to Mr. MacDowell's satisfaction, he accompanied her to Point Breeze, now known as the Atlantic Refining Company, where she received a full cargo; and from there he made the trip to the Maverick Oil Works, in Boston, without a mishap of any kind, delivering her load to the entire satisfaction of all concerned.

About a year after this, when the Roach firm lost the contract for two other barges, Mr. Lewis Nixon, of Elizabethport, New Jersey, being the lowest bidder, the Standard people requested Mr. Roach to permit Mr. MacDowell to spend as much time as possible in the Elizabethport yard to look after the construction of these two barges, both of which were built under his supervision with success.

Some Early Difficulties

A few years later, when Mr. Roach was building the A, B, C, D of the navy, having trouble with the government and being forced through their treatment to make an assignment, Mr. MacDowell accepted the superintendency of the South Chicago Shipyard of Chicago, Illinois. While there he was requested by the Standard Oil Company to make a trip to Buffalo, New York, where barge No. 81 was being built for them and which had been delayed several weeks due to their being unable to make her tight. Mr. MacDowell enlightened them on many subjects, and helped them to get through the difficulty.

After severing his connections with the Harlan & Hollingsworth Yard, which position he held for fourteen years, as superintendent, he has been inspecting the building of vessels for various companies, namely, the Standard Oil Company, Texas Oil Company, Gulf Refining Company, and several others.

Oil Tanker Increase

Only 55 steam tankers, totaling 201,000 gross tons, were flying the American flag in 1914; seven years later there were 356 oil carriers under American registry, with a tonnage ten times that in 1914, according to a table compiled by the bureau of navigation and published in Commerce Reports. The United States now has 53 per cent more tanker tonnage than the United Kingdom. American-flag tankers have accounted for 76 per cent of the total world increase of such tonnage since 1914.

The rapid development of our fleet of tank ships is the story of our increasing dependence upon Mexico for crude oil; in 1914 the United States imported 3,100,000 barrels of oil; in 1920, 105,600,000 barrels. After the outbreak of the war many tankers owned by American capital but operated under foreign flags for reasons of economy were transferred to American registry, 37 such tankers, aggregating 182,000 gross tons, being so transferred in 1915—most of them from Germany.

Statistics of Tonnage

The comparative amounts of merchant steam and gas tanker tonnage accredited to leading countries on June 30 for the years 1914, 1918, 1920 and 1921, are shown in the following table:

Merchant Steam and Gas Tanker Tonnage of Principal Countries on June 30		1914	1918	1920	1921
United States		201,160	844,691	1,362,964	2,121,863
United Kingdom		819,993	1,352,453	1,224,791	1,398,187
Norway		4,728	80,308	107,484	130,864
Holland		83,294	79,388	93,863	115,032
France		11,232	19,054	21,311	47,696
Germany		204,849	48,694	32,059	11,425
Other		106,694	71,579	87,049	145,099
Totals		1,431,950	2,496,167	2,929,521	3,970,166

In addition to the steam and gas tankers, there are in the oil-carrying service 91 sailing and barge vessels of 139,000 gross tons, 105,000 tons of which belong to the United States, and approximately 160,000 tons of navy vessels, 62,000 tons of which belong to the United States.

The essential fact in the oil situation is that the present and future sources of supply outside the United States, which is depending to an in-

creasing extent upon other countries, are all distant overseas from the centers of consumption—for example, Mexico, Persia, the Dutch East Indies, etc.—which means, from the shipping viewpoint, more tankers. Furthermore, the rapid adoption of oil-burning ships (364 vessels, totaling 1,300,000 gross tons in 1914, now 2536 ships of 12,800,000 tons) makes necessary the employment of much tanker tonnage in supplying bunker stations. While many tankers are idle at the present time, any large increase in the world consumption of oil will call for the services of all available tonnage that can carry oil in bulk.

Deaths

Alexander F. Morrison, of San Francisco, a director of the Matson Navigation Company and other large corporations, in Singapore November 13.

Howard Carleton Holmes, civil and consulting engineer and designer of many drydocks, in San Francisco October 30.

John McAteer, president of the McAteer Shipbuilding Company, in Seattle October 24.

Gardiner C. Deering, the oldest active shipbuilder in the United States, in Bath, Maine, October 24 at the age of 88.

James Cant, superintendent of the Wallace Shipbuilding and Drydock Company, Vancouver, in Vancouver October 24.

Martin C. Erismann, formerly naval architect of the Long Beach Shipbuilding Company, in New York City.

Ernest E. Penn, for several years with the Canadian Pacific Railway offices in Portland, San Francisco and Seattle, in Berkeley, California, November 14.

J. F. Lawless, formerly general auditor of the Pacific Coast Company and manager of the Pacific Coast Steamship Company, in Bournemouth, England.

Marine Insurance

CHARLES F. HOWELL, EASTERN CONTRIBUTING EDITOR

The Hague Rules

One of the most interesting subjects before marine underwriters during the past month has been the Hague Rules, 1921, which our English confreres are anxious to have generally adopted. These are the findings made at the Hague conference of the International Law Association, and are heralded as the dawning of the international bill of lading. Several underwriting bodies in Great Britain have passed resolutions favoring an adoption of the rules, and it is said that shipping interests on the other side are cordial toward them. But American marine underwriters are not particularly impressed with the Hague output. Several meetings of the American Institute have been held at which the rules came up for discussion. It was the consensus of opinion that, although they are advantageous in that they fix the carrier's minimum liability at \$100 instead of the present figure of \$100, and have other minor features of interest, still they are but voluntary agreements and never could safeguard the shipper and the underwriter against encroachments of the carriers as the Harter Act would do if the pending amendments to the latter were adopted. And right there is where the hitch comes in. Will the Harter Act ever be amended? For the past ten or fifteen years there have been repeated attempts to have this done, but they have always proved abortive. This year, however, better progress to this end has been made than ever before; and our underwriters feel that rather than abandon so hopeful a case and adopt the Hague Rules, which would mean repealing important portions of the Harter Act, it would be wiser to wait a little longer, now that they have waited so long.

Policies or Certificates

As predicted in these columns, no action has been taken, or is likely to be taken, by American marine insurance interests in altering our time-honored use of marine certificates as convenient substitutes for the original policies. The startling decision of Justice McCardle, of the King's Bench Division of the English High Court of Justice, to the effect that such certificates could not be legally held as full substitutes for the policy, has not materially disturbed the employment of the former. They are in as much



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Charles R. Page, new manager of the Atlantic marine department, Fireman's Fund Insurance Company.

demand as ever, and are being used right along. To do away with these convenient instruments would involve much work and delay in settlements. It has been found advisable, however, to make a short and safe cut through the problem, by including in marine contracts the clause "policies or certificates of insurance." Certain banks and industries have adopted this phraseology, and it appears to be working out to the satisfaction of all.

Page Resigns from Syndicates

One of the most sensational pieces of news since our last issue was the announcement of the resignation of Manager Charles R. Page from the American Marine Insurance Syndicates, as of December 31, to accept the management of the Atlantic marine department of the Fireman's Fund and Home Fire & Marine in succession to Messrs. F. H. and C. R. Osborn, resigned. This has been erroneously construed in certain quarters as indicating a growing lack of faith in the future of the syndicates, but no one scouts such an intimation more sincerely than does Mr. Page himself. As a matter of fact, his new duties will keep him in close touch with the development of those bodies and he will spare no effort to show his confidence in their practical advantages.

Neither of the Messrs. Osborn have any definite plans matured; F. H. is looking forward to a rest at his place at Miami, Florida.

Mr. Page was born at San Francisco, May 24, 1878; was educated at St. Paul's School, Concord, New Hampshire, and at Yale University, from which he was graduated in the class of 1900. He passed twenty years in the service of the Fireman's Fund, specializing in the loss and executive side of the business, and only left that company when President Wilson appointed him to the Shipping Board in 1917. He resigned that connection in 1919 to accept the treasurership of the Atlantic, Gulf & West Indies Steamship Line, which was the holding company for five important steamship lines. In the spring of 1920 he became vice-president of the Clyde and the Mallory lines in charge of operations, and it was that summer that he resigned to take the management of Syndicate A, then in process of organization. With the transfer of the latter's organization and business to its successor corporation, the United States Salvage Association, Inc., his most important service came to a successful conclusion. He has made many friends and admirers in the East, and his work with the Fireman's Fund will be followed with the best wishes of all.

Salvage Association Launched

At a special meeting of the board of managers of the American Marine Insurance Syndicates, it was recently voted to turn over the organization and business of Syndicate A to its successor, the United States Salvage Association, Inc. The entire capital stock of the latter is held by the subscribers of Syndicate A. It is a non-profit making organization, designed to provide for the American shipping trade a service that shall be the counterpart of that furnished British shippers by the Salvage Association of London. It will have agents in all parts of the world and, in fact, through its arrangement with Syndicate A, will at once be provided with carefully selected agents at many of the leading ports. It takes over the present organization of the syndicate, which has established its own offices in Boston, Philadelphia, Baltimore, Norfolk, Savannah, New Orleans, Galveston and San Francisco, with its principal operating office at New York. The surveying staff of the association will be headed by W. C. Foley, as chief surveyor, and J. A. Wilson, as deputy chief surveyor. It commenced operations on November 1, on which date Syndicate A withdrew. The officers elected at the organization meeting were: Benjamin Rush, president; Walter Wood Par-

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PORTLAND, ORE.

FRANK G. TAYLOR, GENERAL AGENT FOR WASHINGTON, OREGON, ALASKA

sons, vice-president; Gomer H. Reese, secretary; and Charles R. Page, general manager.

Mail Truck Robbery

Inland marine underwriters received the shock of their lives when five bandits successfully held up a United States postoffice truck in New York City, a short time ago, and got away with five bags of registered mail containing about \$1,500,000 of negotiable securities and currency. This rude awakening stressed the hazards surrounding the insurance of valuables sent by registered mail. There is little chance to create a reserve adequate to meet a wholesale loss of this magnitude out of the small premium yield derived from writing bonds at from 3 cents to 5 cents a thousand dollars. The effect of the hold-up of the mail truck is reflected in the suggestion now going the rounds that a considerable differential in rate should be charged on negotiable securities as compared with the less hazardous non-negotiable documents.

Demand Simpler Contract

Widespread interest is being taken in the recent meetings held by the American Institute of Marine Underwriters for the purpose of drafting and adopting a modernized standard form of cargo policy. It is an undisputed fact that merchants and bankers, who are no less interested in the policy than the underwriters themselves, are unable to read and understand the form now in use. Time has apparently sanctified the ancient, obsoletely worded contract that has come down to us through the centuries, and the decisions of the courts have so barnacled upon and around every comma and period in it that any possible deviation from the precise language of the policy is regarded with horror. As a matter of fact, it is most misleading. There are apparent contradictions all through it, and the trade

has no time to explore libraries of legal interpretations to discover the extent of the coverage. The attempt to preserve the sanctity of this venerable document has been the direct cause of the many misunderstandings that have arisen between insurance companies and banks as regards certificates and policies. The adoption in Great Britain of the Marine Insurance Act of 1906, which is in reality a codification of the laws of marine insurance in that country, was evidence of the need for a clarification of the marine contract; and that act has gone far to remove the unintelligibility of the archaic form and smooth out the misunderstandings general on the other side. It should be of the first importance to our underwriters in rewriting the policy in America. The warehouse clause has a conspicuous place among those that should be made simpler and clearer.

Official Changes

Among the more conspicuous office developments of the last thirty days may be mentioned the following:

Carpenter & Baker, of New York, have been appointed marine managers of the Western Assurance for the United States, the company having again decided to engage in ocean marine after eighteen months' discontinuance of this line. It was natural that it should select Carpenter & Baker to represent these larger interests, as this office has had the inland marine agency of the Western Assurance for more than forty years. The difficulty less experienced underwriters are having in connecting up with desirable companies was well illustrated in the placing of this enterprise; fully a dozen of them were after the Western Assurance, but without success.

R. A. Fulton has resigned as vice-president of Talbot, Bird & Company, Inc., as also from the directorate of the Universal Insurance Company. His future plans have not been an-

nounced. He had been the incumbent of his late vice-presidency for five years, prior to which he had been a deputy assistant manager of the group of companies represented by H. K. Fowler. He is a graduate of the Thames & Mersey office, of England, the best school for underwriters in the United Kingdom.

Raymond A. Day has resigned as loss manager for the Shippers' Underwriting Agency, New York, and has been succeeded by James Murphy, of the staff of O'Keefe & Lynch.

British Marine Results in 1920

Official reports of the operations of the British marine insurance companies in 1920 have been all filed, and they show that the results for that year were not as profitable as for the preceding twelve months. The premiums for 1920 amounted to \$34,076,598, and the losses for the same period reached \$26,020,324, making a ratio of 76.5 as contrasted with one of 68 for 1919. The premium account increased by a comfortable margin, but the loss ratio more than kept pace. The expenses of the 1920 business amounted to 9.2 per cent of the premiums.

C. F. H.

A Bad Year

Pacific Coast business, in the opinion of most underwriters, has made little if any real improvement within the last six months. Aside from the movement of seasonal products there is little export freight offering and what does go forward is at such lower values than obtained a year or two ago that insurance premiums undergo a double shrinkage.

A few underwriters do not join in the general report of slack trade. To such as do not, the tide has definitely turned; they regard the worst of the depression as being over and view the prospects for 1922 with quite a bit of optimism. But many decline to join in this belief. These latter hold that the spurt of July, which appears to have been

INSURANCE COMPANY

Freights and Disbursements

STREETS, SAN FRANCISCO, CALIFORNIA

W. H. WOODRUFF, Special Agent
LOS ANGELES
230 BYRNE BUILDING

F. H. & C. R. OSBORN, Managers
ATLANTIC MARINE DEPARTMENT
72 BEAVER STREET NEW YORK

AND BRITISH COLUMBIA, 309 COLMAN BUILDING, SEATTLE, WASHINGTON

unexpectedly general, was merely a temporary gain that has been followed by another slump. On the books of a number of companies July does stand as an isolated peak in a decline that became bad about March and has continued, except for the one revival, ever since. Minor gains are reported for different months by different companies, but that changes for the better have not been general is indicated quite clearly by the fact that one underwriter did a fair volume of business in September, while that month was poor for another firm.

To crown all, losses of the year have been severe. Some total losses of heavily-laden steel steamships, notable among which were two Japanese vessels in the North Pacific, have been accompanied by a host of smaller disasters, which in the aggregate have run to large amounts. The year has been decidedly bad.

A U. S. S. B. Company

Reports from the East say that the Shipping Board has under consideration the organization of an insurance company to write policies on cargo transported in government vessels. "At the present time," it is said, "the insurance companies rate virtually all of the Shipping Board vessels as Class B and Class C, forcing the shipper to pay a higher charge for insurance than on the older established lines. In fixing the rates on cargoes, the marine insurance companies take into consideration the losses incurred by shippers on the vessels of the various steamship lines over a long period of years. The premium bears a direct relation to the results of operation." Commissioner Meyer Lissner, in charge of insurance for the board, has been studying the situation.

The following letter has been addressed by S. D. McComb, manager, Marine Office of America, to Captain Charles A. McAllister, vice-president

of the American Bureau of Shipping:

Both in the daily press and in many magazines, articles have appeared expressing the belief that users of Shipping Board boats have been penalized in their insurance rates, and that there is a tendency on the part of marine insurance companies to charge higher rates on Shipping Board boats as such. A careful investigation of this confirms my belief that there is absolutely no foundations for such a statement. I know of no marine insurance company which does such a thing. In any given trade the rates are fixed for different lines. If there is a line of steamers which operates good boats, is under competent management, with reliable officers, and has a record showing few claims year in and year out, that line will be given a low rate in accordance with its record. Another line may be operating between the same points, the management and personnel not so good, have a record of having frequent claims, and shippers by that line will be charged accordingly. If some men with no knowledge whatever of the steamship business start a new line, and in the underwriter's opinion the men are incompetent, the probabilities are that their record will be bad, and rates will be fixed on that basis.

It is an unfortunate fact that many operators of Shipping Board boats were incompetent and had a bad record, and rates on these boats are fixed in accordance with the record. The fact that they were Shipping Board boats had nothing whatever to do with the rates. Where Shipping Board boats were in the hands of competent operators, the rates on these boats were exactly the same as on similar boats which the same operators owned themselves. Some of the incompetent operators, with bad records, complain because they were not given the same rates as competent operators who had an honorable record of a year's standing, but there is no basis for a just complaint, as rates are based on results.

How Values Have Dropped

The National City Bank of New York reports the following declines in values of exports: Corn exported in August, 1921, went at 64 cents a bushel against \$1.75 in August of last year; wheat, \$1.40 per bushel against \$2.90; flour \$6.60 per barrel against \$12.15 in August, 1920; bituminous coal, \$4.83 per ton against \$10.35; raw cotton, 11.9 cents per pound against 37.5 cents a year ago; pig iron, \$26 per ton against \$50; steel billets, \$27.55 per ton against \$61.60; mens' boots and shoes, \$2.70 per pair against \$5.16; crude mineral oil, 3.5 cents per gallon against 10 cents per gallon a year ago; refined sugar, 4.8 cents per pound against 10.5 cents in August of last year; and pitch pine lumber, \$31.40 per M feet against \$62.30 one year ago. Meats show a fall, but not so great as that of many other articles named; fresh beef exported having averaged 12.8 cents per pound in August, 1921, against 18 cents in August of last year; and bacon 16 cents per pound against 24 cents one year ago.

Although underwriters are well aware of the decrease in values, they probably will be interested in these precise figures.

Here and There

An appropriation of \$45,000 included in the current budget of Tacoma, Washington, for the construction of a fireboat, has been ordered returned to the general fund by the city council. An item of \$30,000, inserted in the new budget for the same purpose, the cost of the fireboat being put at \$75,000, was stricken out.

* * *

Japanese marine insurance business written during August aggregated yen 719,685,000, as against yen 856,269,000 of July.

* * *

Approximate losses on recent Pacific casualties are: Yamashita Ki-

sen Kaisha steamship Fukui Maru, abandoned in the North Pacific October 27 after a severe hurricane had disabled her, cargo, consisting of 2,000,000 feet of lumber and 1500 tons of wheat, about \$350,000, hull placed in Japan; Balfour-Guthrie schooner David Evans, burned off Timor, \$40,000 hull; Moore schooner Carrier Dove, ashore on Molokai, \$77,000 cargo, no hull; Crowley-Mahoney steam schooner Thomas Crowley, ashore near Point Conception but pulled off, \$175,000 hull.

* * *

The Supreme Court of British Columbia has ordered the restoration of the license of Captain William Bradley, master of the C. G. M. M. Canadian Exporter, lost off the Oregon coast a few months ago. His license had been suspended for six months. In his appeal Captain Bradley asserted that he did not know that he was being tried and that he had had no opportunity to defend himself.

* * *

The license of Captain D. G. Cameron, master of the General Petroleum tanker Liebre, has been suspended as a result of the grounding of the vessel on Anacapa Island in February.

* * *

The monthly return of casualties issued by the Liverpool Underwriters' Association, covering ships of more than 500 tons, shows that during August 19 vessels of 52,104 tons were totally lost. Of these there were six British steamers of 23,674 tons, three American steamers of 13,069 tons and four Japanese steamers of 7907 tons. Twelve of these losses were ascribed to strandings, five to fires and explosions, one abandoned, and one missing. This total compares with 16 vessels of 23,943 tons in August last year and

13 vessels of 26,980 tons in August, 1919. There were also reported 363 other casualties. Of these 16 were due to weather damage, 77 to stranding, 81 to collision, and 37 to fire or explosion. The number of steamers which suffered damage to machinery, shafts or propellers was 87.

* * *

Three suits for more than \$30,000 in the aggregate were filed in the United States District Court, San Francisco, on November 15 by passengers of the Alaska, lost August 6, against the San Francisco & Portland Steamship Company. More than forty other claims remain to be filed by one attorney, it was said.

The American schooner Carrier Dove, wrecked on the Island of Molokai, Hawaii, November 2, was "lost" twice before, once in September, 1903, on the China coast, and again in February, 1920, during a hurricane that cast her on a reef of Fiji. She was salvaged both times. No salvage of the latest wreck is possible.

H. S. Bates, Pacific Coast director of Willcox, Peck & Hughes, announces the following changes in the Pacific Coast organization: John G. Johnston, manager fire insurance department, promoted manager; I. Barrett, assistant manager transferred to acquisition department; O. Tinnemann, formerly assistant manager fire department, promoted to manager; J. S. O'Neill, formerly in casualty department, appointed manager of department; G. W. Cortel-you, in charge marine business in Southern California, transferred to marine department, San Francisco; W. R. Hamilton, manager Seattle office, has resigned, and J. F. Beede, formerly in charge of marine department in Seattle, made manager of Seattle office.

F. G. Phillips, formerly controller of the Los Angeles Shipbuilding & Drydock Company, has opened an office as certified public accountant in San Francisco.

Vance Thompson, editor of the Coast Seamen's Journal, the organ of the Sailors' Union of the Pacific, has been succeeded by Selim A. Silva, formerly business manager. Mr. Thompson had been accused by Andrew Furuseth of bolshevism.

Chandler P. Anderson of New York has been appointed by President Harding as an arbitrator to adjust Norwegian claims against the United States, which arose out of the requisition of vessels building at the time of the entrance of the United States into the war. W. C. Bennif of Indiana will represent the Shipping Board before the commission.

A. B. Natland, former manager of the Seattle branch, Atlantic-Gulf & Pacific, has resigned.

E. L. Fairbanks has been appointed Seattle manager of the Northwest Shipping Company of Portland, with offices in the Colman building.

A. H. Bryant, formerly in charge of the Portland office of the American Bureau of Shipping, has been made assistant to Captain W. C. McNaught, surveyor of the Board of Marine Underwriters of San Francisco.

S. L. Kreider was re-elected president of the World Traders of Los Angeles at the annual election in November. Other officials are: H. C. Mead, vice-president; E. A. Mills, secretary; J. Forsyth, treasurer; R. D. Kaufman, assistant secretary-treasurer; directors, Marius de Brabant, Maynard McFie, C. S. Beesmyer, C. H. Matson and Leo Chandler.

Captain J. S. Gibson, president of the International Stevedoring Company of Seattle, is one of fourteen regional directors of the emergency relief program of the national unemployment conference. He was appointed by Secretary of Commerce Hoover.

A. J. Mickley has been appointed assistant manager of the Puget Sound branch of the Northwest Shipping Company. E. L. Fairbanks is manager.

Edgar McKee has been appointed president of the Los Angeles Harbor Commission, and has been succeeded as a member of the commission by O. B. Kibele.

Frank W. Relyea, formerly traffic manager of Livermore, Dearborn & Company, has been appointed to suc-

About People

Personals

Captain John A. Spillman, general manager of the Globe Shipbuilding and Drydock Company's plant at Fairfield, Baltimore, has been elected president of the company, succeeding Benjamin C. Cooke, who resigned to enter other business. Although Captain Spillman has taken up his new duties, Mr. Cooke will continue to act for some time in an advisory capacity. Captain Spillman is a graduate naval constructor and has had many years' experience. He formerly had supervision over repair work in various yards for the Navy, and during the war was in charge of repair work at Brooklyn

Navy Yard. H. S. Brown, formerly superintendent at the Globe plant, has been promoted to be works manager. No other changes were made in the staff.

S. W. Atkins has been made personal representative of the Java-China-Japan line, represented in San Francisco by J. D. Spreckels & Bros. Company. He succeeds J. A. Doyer, who has been transferred to Shanghai.

F. C. Devine, formerly freight agent for W. C. Dawson & Company, and Northwest traffic manager for the General Steamship Corporation, has been appointed Seattle agent of the Atlantic-Gulf & Pacific.

ceed H. H. Ebey as district director, Shipping Board, San Francisco.

William B. Hamilton, former special deputy collector of customs, San Francisco, is now collector, succeeding J. O. Davis. Lawrence J. Flaherty is surveyor of customs, succeeding John S. Irby.

A. E. Carter and Charles T. Howard of Oakland were elected president and secretary of the Pacific Coast Association of Port Authorities at the recent annual convention. The next convention will be held in Oakland.

Captain Philip Svendsen, San Francisco port captain of the South American Pacific (Lindvig) Line prior to the withdrawal of the line from business, has returned as port captain of the Latin-American Line, the new Lindvig enterprise.

E. E. Remsburg, brother-in-law of President Harding, has been appointed Shipping Board agent at Los Angeles.

Sir Bertram Hayes, commander of the White Star liner Olympic, will take command of the Majestic when she is commissioned in the spring of 1922. Captain A. E. S. Hambleton of the Adriatic will succeed Sir Bertram on the Olympic.

A. A. Moran, of the San Francisco office of the Robert Dollar Company, has been made general traffic manager, with headquarters in New York. Traffic managers will be ap-



Harry Hill, president of Hill, Hubbell & Company and of the Bird-Archer Company of California, died at his home in San Francisco September 29, after an illness of four months. Mr. Hill was born in Saginaw, Michigan, in 1875, but had been a resident of San Francisco since 1905.

His first business connections in San Francisco were with the Progress Steamship Company and the Saginaw Steel Steamship Company, most of the vessels of which were Lake freighters that were taken to the Pacific through the Welland Canal. Following upon his connection with these corporations as a director, Mr. Hill became president of the Santa Maria Steamship Company. In the ownership and operation of these vessels Mr. Hill was associated with James Jarome, and the two were among the pioneers of the Pacific Coast colliery trade and, when oil began to supplant coal, led in converting colliers to tankers.

In 1904 the Bird-Archer Company of California was formed and Hill, Hubbell & Company followed in 1907.

Prior to engaging in business Mr. Hill was first lieutenant in a Michigan volunteer regiment during the Spanish-American War.

He is survived by his widow, Mrs. Ruth Hill, and by two daughters, Arline and Justina. R. H. Hubbell has succeeded Mr. Hill as president of the Bird-Archer Company of California and Hill, Hubbell & Company.

pointed for New York, San Francisco, Vancouver and Shanghai.

John T. Byrne, secretary of Talbot, Bird & Company, New York, has been elected vice-president of the company. He retains his position as secretary.

Henry Dearborn, president of the American-Hawaiian Steamship Company, sailed for Europe November 14 on the Aquitania. He will spend several months in the United Kingdom and on the Continent in connection with the Pacific Coast-European service that the American-Hawaiian Steamship Company recently inaugurated. This service offers direct fortnightly sailings from the principal United States ports to Liverpool, Glasgow, Hamburg, Antwerp, and Havre.

Lieutenant F. X. Maher, C. C., U. S. N., has been detached from service on U. S. S. Melville, repair ship for destroyers at San Diego, and assigned to duty at the plant of the Los Angeles Shipbuilding & Drydock Company to supervise the drydocking of destroyers, submarines and fleet auxiliaries, which are being sent there for hull cleaning, painting and minor repairs.

Lieutenant M. B. Pollock, C. C., U. S. N., who has supervised the navy work at the Los Angeles plant for some months, has been detached and ordered to the U. S. S. Vestal, repair ship to the Pacific fleet, stationed in Los Angeles harbor.



Wreck of the Pacific Mail Steamship San Jose on San Roque Reef

Photo by R. M. Byrne, Los Angeles

DIESEL SHIP MANEUVERING

By ALEXANDER McNAB, M.I.M.E.

THE great interest shown in the Diesel electric drive by marine engineers throughout the world is evident by the many papers read on this subject by the members of the various engineering societies and also by the many articles which have appeared in the technical press from time to time.

It is generally admitted that the electric drive offers many attractive features, especially when applied to vessels of war. Such features, however, do not seem to attract the average commercial shipowner due to the fact that he generally regards the electric drive as something beyond the ability of the average crew to operate and maintain. It is also recognized that the electric drive cannot be compared to the direct Diesel drive when economy is to be considered.

The commercial success of the direct Diesel driven ship is evident by the success already attained, also by the amount of new tonnage under construction in Europe which will be fitted with this method of propulsion. Therefore, if the shipowner hopes to compete in the world's carrying trade, economy in the operation of the propelling unit must be his first consideration. The greatest testimony to the Diesel engine is the number of motorships in successful operation today and the fact that voyages are undertaken and marine conditions accepted without any trepidation because of the machinery installed. It is generally recognized that on long non-stop runs the Diesel engine has a reliability equal to that of the average steam reciprocating engine, the fuel consumption being about one-third the quantity of oil fuel. The maneuvering ability of the Diesel engine cannot be compared to that of the steam reciprocating engine and to overcome this the Diesel electric drive was first introduced.

To obtain that maneuvering ability so much desired, it should have been our aim to further simplify a known reliable and economical propelling unit, the Diesel engine, instead of adding further complicated electric mechanism which naturally destroys that economy so much desired and adds materially to maintenance and operative costs.

The first engine brought out by Dr. Rudolf Diesel was non-reversible. It was therefore natural that the marine engineer went to work to make this type of engine reversi-

ble before it could be successfully applied to ship propulsion. It may seem preposterous, at this late date, to state that the Diesel engine need never have been made reversible to accomplish the most exacting requirements necessary in ship maneuvering. This point I will refer to later.

The marine engineer has always devoted himself to that branch of design and construction pertaining to the propelling unit and the necessary auxiliaries which go to make up the engineering equipment of the modern ship, the hull design being left entirely to the naval architect; it would appear, however, from the success which has attended a recent invention that the marine engineer should have paid more attention to the ordinary ship's rudder which with slight alteration is capable of maneuvering a self-propelled ship in such a manner as never before equalled in the history of navigation. It is a somewhat remarkable fact that, with all the far-reaching developments in the construction and design of the modern ship, the design of the ship's rudder is practically the same today as it was in the days of the ancients, it also being thought today, as in the days of the ancients, that the rudder's only function was that of the steering of a ship.

The ingenious apparatus which brought the subject matter to the author's notice is the form of maneuvering and reversing rudders evolved by Mr. J. G. A. Kitchen. Already numerous articles have been published in the press and technical magazines of this country and abroad in connection with this subject; also, due to the fact that a large number of installations have successfully been made, it can hardly be expected that much of this material given here is new.

The essential parts of the Kitchen rudders consist of two curved deflectors which partly enclose the propeller; both deflectors are pivoted on top and bottom on common centers. By suitable mechanism the deflectors or rudders are made to turn together in the same direction or equally in opposite directions.

With these rudders the ship can be steered in the ordinary manner by carrying helm, excepting, however, that the power required for steering can be greatly decreased, this due to its being found that 25 degrees of helm is sufficient for all practical purposes. It has been practically demonstrated that the actual steering ability of these rudders in the ahead or astern direction is much greater than that of the usual form of rudder. It is therefore evident, by the many installations of Kitchen's rudders already made, that to also gain ship speed, control and maneuvering ability the steering quality of the rudder has not been sacrificed but greatly enhanced.

It is interesting to record the maneuvering ability of such Diesel-engined ships, already fitted with the Kitchen rudders, as compared with the maneuvering ability of the Diesel electric drive.

Any shipowner giving consideration to this new form of rudder will realize the saving in first cost and simplification of the Diesel propelling unit and auxiliaries; it should also appeal to engineers, as well as the saving in power and fuel by the increased efficiency of propulsion.

There is no reason why the rudders should not be fitted to the larger type of ocean freighter, as the many installations already made have proved eminently satisfactory, this due to the hard work and ingenuity which has already been done in bringing the rudders and operating gear up to its present state of efficiency.

Diesel Electric Drive With Ordinary Rudder

1. Maneuvering control from bridge without reference to engine room.
2. Engine (non-reversible) runs in one direction only.
3. Flexibility of ahead speed ranging from zero to maximum, as desired.
4. Flexibility of astern speed same as above.
5. From full ahead, ship cannot be brought to dead stop in less than 6 to 7 times her own length.
6. Single screw ship cannot repeat this maneuver.

Diesel Direct Drive With Kitchen Reversing Rudder

1. Maneuvering control from bridge without reference to engine room.
2. Engine (non-reversible) runs in one direction only.
3. Flexibility of ahead speed ranging from zero to maximum, as desired.
4. Flexibility of astern speed same as above.
5. From full ahead, single screw ship can be brought to dead stop in ship's own length.
6. Single screw ship can be rotated as if on a pivot on own axis.

THE PRELIMINARY TO A PROMISE

An Ardent Fisherman Projects Some Good Fish Stories

By H. A. B. SNEVE
Of the Weeks-Howe-Emerson Company

ON a recent visit to the Pacific Marine Review office it was insisted by "The Powers that Are," there, that the ideal man to send them interesting marine and commercial fishing news, as well as photographs taken along the path of travel along this coast and Hawaii, should be the traveling salesman selling ship chandlery, flags and fishing supplies to the trade at every port large and small between San Diego in the south to Vancouver and Seattle in the north, and the Hawaiian Islands in the west; and as that has been my lot since the war, their choice fell on me.

I have promised to write and "kodak as I go," both while at work and play. The most thrilling of the latter so far has been surf-board riding at Waikiki and fishing for the big ones out of Hilo, which sport was only equaled by a 40-mile ride I took via pack and saddle horse on the government trail up the St. Joe River on a week-end while working Coeur d'Alene Lake ports in Idaho last summer. The trout were the biggest and the hungriest, to say noth-



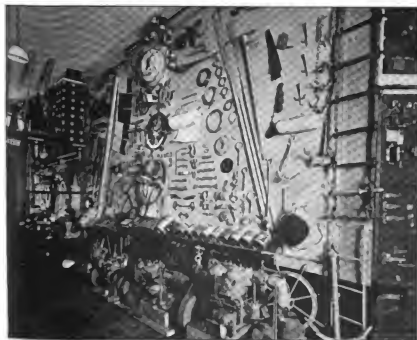
One corner of a window display showing ship chandlery, nets and twine

ing of gamiest, I have ever tackled, second only to the fighting Uluus in the Hawaiian waters.

As this preliminary "leaves me" at the home port, my kodak offering in this issue will be of the work I enjoy most next to selling anchors and fish

hooks—namely, arranging our goods in window display fashion—of which work my boss always has plenty saved up for me while sojourning in the home port at 90 Market Street.

Here endeth the preliminary—much is left unsaid.



A well arranged sample board



Corner of display window showing sportsman's fishing tackle and an arrangement of national and house flags



The steam cruising yacht Louise

THE STEAM YACHT LOUISE

ON October 2 the steam yacht Louise, owned by E. D. Burge of Newport, California, arrived in San Francisco thirty-four hours out of Newport on a special mission in connection with the moving picture industry of Southern California. A representative of Pacific Marine Review called on Captain William Reid, and gleaned the following particulars.

The Louise is a wooden vessel, 102 feet long over-all, 84 feet long on the water line, 14 feet extreme breadth, with a molded depth of 8 feet 2 inches and a draft of 4 feet 4 inches. She was designed by N. G. Herreshoff, probably the most famous yacht designer in the world, and built by the Herreshoff Manufacturing Company at Bristol, Rhode Island, in 1893.

She is powered with a triple expansion steam engine 7 inches by $11\frac{1}{4}$ inches by $17\frac{1}{2}$ inches cylinder diameters and 10-inch stroke, and has one watertube boiler installed by the Seabury Company in 1910. The Louise has a net tonnage of 24 and a gross registered tonnage of 49. Her engines develop 340 horsepower, which drives the hull at a cruising speed of 12 knots. By forcing the boilers and engines she can be driven through the water for a short period at 15 knots. The fuel oil tanks have sufficient capacity for a 2000-mile steaming radius.

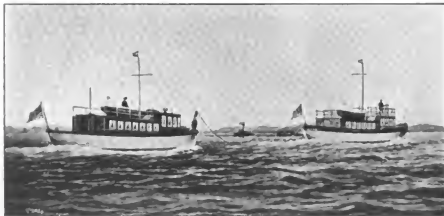
There are accommodations for seven of the crew and ten to twelve passengers. She is equipped with wireless, with specially built lifeboats, and has considerable capacity in refrigeration equipment for tak-

ing care of perishable stores for the commissary.

Recently in a Southern California shipyard the Louise was completely overhauled, replanked and refitted. Her owner has arranged an extended itinerary for cruising in Pacific Coast waters during the next two or three years. His plans include practically the entire West Coast of the two Americas.

A NEW ERA IN YACHTING

FEW years back William T. Donnelly, consulting engineer of New York City, prominently known for his work in the design and construction of floating drydocks, conceived the idea of working small vessels in convoy, the leading vessel having an electric power plant which distributed power by cable to motors in the following vessels. Mr. Donnelly has now built and equipped two such boats for his own use; one, the New Era, being used as a power plant and workshop; the other, the Dawn, being supplied from the New Era with power and being fitted up as a floating home for Mr. Donnelly's family. The family have had several extended cruises running as far south from New York as the Bermudas with great comfort and comparatively little expense. Mr. Donnelly recommends his idea to all those who love the life of the water.



The electrically propelled yachts New Era and Dawn on the Hudson River

DIESEL POWER FOR FISH BOATS

A MARKED degree of interest has been noted lately among fishermen of the San Francisco bay district in the application of crude oil motors to fishing craft. Several new installations have been made and quite a number of conversions from steam and from distillate engines to Diesel or semi-Diesel engines burning the heavier grades of oil fuel.

Notable among the conversion jobs is that of the Paladini fish carrier *Three Sisters*. This boat, 59 feet 10 inches over all length by 14 feet beam, was formerly operated by a distillate engine of 110 H. P. Her owner determined on making a change and ordered the replacing of this engine with a 100 H. P. 4-cylinder full Diesel engine as manufactured by the Enterprise Engine Company of San Francisco. She was taken to the boatbuilding yard of William Cryer on the Oakland estuary, and the installation of the engine and complete overhaul and refitting of the boat was finished there about three months ago.

This boat has now been running continuously for over ten weeks, a large part of that time for twenty-three hours during the day. She makes better time than formerly and is now considered one of the fastest boats in the local fishing fleet. With her distillate power plant the cost of operation for fuel was \$2.56 per hour. With the present Diesel engine running on 14 degree gravity of fuel oil the cost is 24½ cents per hour. This saving alone amounts to over \$8000 per year, and the saving in lubricating oil also amounts to considerable, so that the owner confidently expects his boat to pay for itself in a very short time.

The writer was told by a marine engineer, who happened to be present when the cylinders of this engine were uncovered for inspection after seven weeks' continuous running in sea service, that the surfaces and cylinder walls and the valve seats were as clean and as perfect as if they had just come off the grinder. The engine during these seven weeks had been running on fuel oil of 17 plus degrees Baume, using 27-degree fuel for a few moments on starting and before stopping, the 17-degree fuel being heated by the Enterprise system before introduction into the cylinders.

Another notable conversion job is that on the Osborn and Bornholdt tug *Rover*. The *Rover* was formerly operated by a steam plant and used as a general purpose tug on San



Photo by Moulton, San Francisco
The boats *Three Sisters* and *Rover* pulled out at William Cryer's yard, Oakland, for overhauling and equipment with Enterprise Diesel engines

Francisco Bay and the Sacramento River. Her steam plant is being replaced also with a 100 H. P. Enterprise Diesel engine. This boat is also being remodeled at Cryer's yard, and the owners are sparing neither time nor expense in their effort to make her the best towboat of her class on the bay.

She is 63 feet over-all length and

15 feet beam. Her propeller is 54 inches in diameter, 4-blade, and at full speed turns 320 revolutions, driving the hull at 10 miles per hour. The *Rover* will certainly be a very economical towboat, and many of the owners and operators of commercial craft on San Francisco Bay will be watching her operation with great interest.

An Interesting Salvage

WHEN last spring the old American frigate *Granite State*, the keel of which was laid in 1812, was burned as she lay tied up to the east bank of the Hudson off Ninety-seventh street, New York City, officers of the United States Navy believed they were confronted with considerable expense for removing the charred ruin.

But the copper sheathing on her bottom and copper alloy spikes in the hull made it worth while for a firm of wreckers to purchase her, on the marine terms "as is and where is," and to go to the heavy expense of floating the hull in order to tow it to a point where the metal can be reclaimed.

The *Granite State* was the oldest warship in the American Navy. The copper sheathing on the bottom of the ship, which was applied at Portsmouth, New Hampshire, in 1846, was found to be in an excellent state of preservation.

A corps of thirty men, including two drivers, are at present at work closing the ship's hatches and completing the work of float-

ing the hull. What remains of the *Granite State* will then be towed to Cow Bay, near Bayside, Long Island, where the hulk will be beached and the destruction of the vessel by fire completed. The ashes will then be washed and the metal reclaimed.

The *Granite State* did duty in four wars, but, as far as is known, a gun never was fired from her decks at a hostile ship. The ship was commissioned in 1846 as the *New Hampshire*, with a crew of 1000 men.

In 1861 she was sent to Port Royal and remained there during the Civil War, serving as a supply ship. In 1872 the *Granite State* was towed to New London, where it was used as a receiving ship. Newport, Rhode Island, was its next location, where in 1876 she went into service as a training ship for naval apprentices.

In 1889 the *Granite State* was anchored in Sandy Hook Bay, serving as a cholera ship during the epidemic at that time. Incoming passengers were landed at Fire Island and the contagious cases transferred to the *Granite State*.

Controlling the Electrical Equipment for Merchant Ships.

DECK WINCH EQUIPMENTS



The auxiliary upon which probably more thought and study is being given at the present time, from an electrical standpoint, than any other on shipboard, is the cargo deck winch. This is an especially important piece of machinery, particularly when installed on a vessel handling miscellaneous cargo. In a deck winch equipment reliability of operation and range of speed control in both hoisting and lowering, are of prime consideration. Of only slightly less importance are such details as watertight construction of motors and controlling devices, accessibility of parts for repairs, and convenience of operation.

Some of the earlier vessels utilizing electricity for power purposes, such as Battleships Kearsage and Kentucky, and merchant vessels Minnesota and Dakota, used electricity in the operation of their deck winches, the application, however, in these earlier installations was naturally somewhat primitive and simply applied a motor and controller of more or less standard designs to the winch. In the last two or three years, however, close study has been made of complete designs of electric cargo winches with a view to having all parts arranged to obtain the best operating conditions and service.

Some of these later designs cover a self-contained winch with electrical parts mounted either upon or inside the specially designed bedplate. Others cover an arrangement for the remote control of the winches by small watertight master controllers with the main controlling apparatus, rheostats, etc., located in small adjacent deck housings. This arrangement offers advantage from the standpoint of accessibility of electrical apparatus and ventilation of rheostats, etc.

Speed in Operation Gained Through Proper Control

In view of the importance of this auxiliary on cargo vessels, there has recently been much discussion naturally with regard to the exact character of the control and the results to be accomplished. One point is obvious, however, that the ideal electric deck winch is one which provides, as nearly as practicable, a straight horse-power curve accommodating its speed automatically to the value of the load and permitting the handling of light and heavy loads without the necessity of changing gears. Also, one that gives in lowering, as nearly as practicable, corresponding range of speed for handling light loads down to the empty hook, as time gained in hoisting and lowering the empty hook is that much clear gain in loading and unloading cargo.

Compared to that control just outlined, the early types of control furnished for deck winches are crude. However, it is now possible to get electric equipments much better suited to the actual requirements of a vessel, and Cutler-Hammer engineers are constantly giving their close study to these needs.

The Cutler-Hammer Mfg. Co. is prepared to supply complete electrical equipments for deck winches and will be pleased to furnish you with general or detailed information on request. Our Publications No. 819 and No. 890 illustrate some work which has been done along these lines.

Marine Department

THE CUTLER-HAMMER MFG. CO.

50 Church Street

New York City

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NEW ENTERPRISE DIESEL ENGINE

OUR illustration shows the cannery tender and towboat Grizzly II which was built at the Schertzer plant for Captain Frank Nordland and is now busily engaged in towboat work on Puget Sound. The Grizzly II should be particularly interesting to San Francisco towboat owners in that she is engined with one of the new Enterprise full Diesel oil engines.

This engine is of the same type as that which was fully described on page 61 of Pacific Marine Review for April. It is the 4-cylinder size, nominally developing 100 H. P. and capable of operating continuously at a very considerable overload.

The new engine is very compact and simple in its design and shows in operation a very great economy as compared with any gasoline, distillate or kerosene engine. Its fuel cost is less than one-quarter that of the ordinary distillate engine of the same power when operating on full load, and at fractional loads this ratio would be greatly increased in favor of the Diesel.



The cannery tender and towboat Grizzly II engined with a four-cylinder 100-horsepower Enterprise Diesel oil engine

The care of this engine under operating conditions and its maintenance and repair do not present any problems differing from those with which the ordinary internal combustion engineer using distillate has to deal, and its very obvious economy should recommend it to all operators of small tugs, tenders, fishing boats, and other craft requiring dependable power at low cost for their propulsion.

The engines for marine purposes are equipped with the well-known Enterprise reversing gears, and the long experience of the Enterprise Engine Company in the building of marine engines for Pacific Coast needs enables them to put into this engine everything that is required to make it a dependable servant to the operators of boats on our difficult coast.

The engine starts very readily on compressed air at 140 pounds, and once started and kept lubricated it can be depended upon to remain in operation under all ordinary circumstances while fuel supply holds out.

A FOUR-IN-ONE LANTERN

AN unusual electric lantern, the Quick-Lite, which has been perfected and placed upon the market by the Kwik-Lite Electric Corporation, 360 Kearny street, San Francisco, will interest shipowners and others to whom oil-burning lanterns and unguarded electric lights are constant sources of danger. The Quick-Lite bears a superficial resemblance to the ordinary railroad lantern, in that a heavy wire guard is one of the conspicuous features; but in its essentials the new light is a considerable advance.

It possesses two globes and a Quick-Lite duplex battery, so that either globe, or both, if an unusual light is required, may be switched on. This design makes possible an instant intensifying of the light given; but more important, it increases the working life of the batteries



The Quick-Lite electric battery lantern

considerably, since one may be rested for half the time, and the two, alternately, give 75 hours of burning from the one battery. Not only has the Quick-Lite Electric two globes and a duplex battery, but it also has two colors, white and red, either being supplanted

by the other when the operator presses a button.

The upper portion of the lamp, which contains the battery, consists of a steel cylinder, copper-finished and lastly nickel-plated. Below this projects a heavy glass globe, within which are the incandescent bulbs, and the glass globe, in turn, is protected by a wire frame. As a result of this sensible design, the light shines downward, precisely where it is wanted, instead of being obscured, as in oil-lanterns, by the oil-container.

The Quick-Lite electric has manifold attractions for the railroad man, camper, automobile driver and a hundred other persons, but not least for the shipowner and sailor. It should be especially valuable in tank steamships, which often have been the scenes of ex-

plosions when ordinary incandescent globes have been broken and the hot wire exposed to gases. How such an accident could occur with the Quick-Lite electric is difficult to imagine, because the wire guard and the heavy glass, both of which serve as guards to the incandescent lights, give protection against any probable mishap or mishandling. As a Northwestern Pacific switchman wrote to the Kwik-Lite Electric Corporation: "While trying one of your electric lanterns switching in Santa Rosa yard, the car I was riding on was derailed and threw me on the ground, and I rolled about ten feet. The lantern went about ten feet further than I did and was still burning, so I got up and got the lantern and gave a stop signal."



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Mr. Shipowner—Mr. Merchant

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PLEASE MENTION PACIFIC MARINE REVIEW WHEN YOU WRITE

DIEHL MOISTURE-PROOF FANS

ALL fittings and accessories to be used on shipboard must, in order to give good service, be moisture-proof. This is especially true of electrical apparatus where failure to exclude moisture not only results in deterioration of material, corrosion, etc., but may cause short-circuiting of electric conductors with disastrous results.

The Diehl Manufacturing Company, in placing before the American merchant marine its line of bracket and ventilating fans, has taken every possible precaution to insure steady service with the least possible maintenance expense and with the greatest efficiency. The direct current motor is made in such a manner that no atmospheric moisture can come in contact with any of its vital parts, and the blades of the fan are constructed of solid brass.

The fans are made both in the oscillating and non-oscillating types. The oscillating type has an oscillating radius of 90 degrees, and the non-oscillating type has a swivel adjustment so that it can be set at any point of the 360 degrees simply by

the manipulation of a thumb screw below the motor head. This swivel adjustment has become very popular, the passenger in his stateroom being able to direct the breeze from the fan to any point desired. We illustrate herewith a number of the types of ventilating fans manufactured by the Diehl Manufacturing Company, who have been building fans for the past thirty-two years. Each fan is equipped with cord and plug and packed in a substantial individual wooden case. These fans have been used exclusively in the Pullman service for a number of years and have been very extensively used on shipboard. The following list of ships in which Diehl fans are used, or specified to be used, shows the high opinion with which these ventilating machines are regarded by the maritime trade: Steamships Nanking, Creole State, Wolverine State, Golden State, Hawkeye State, four United States Coast Guard cutters, and four tankers under construction for the Anglo-Saxon Petroleum Company,

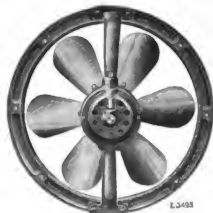
Ltd., at the Union Construction Company, Oakland, California. The Diehl Manufacturing Company furnished Navy fans for all the United States Shipping Board ships built by the New York Shipbuilding Corporation, the William Cramp & Sons Ship and Engine Building Company, Newport News Shipbuilding Company, Sun Shipbuilding Company, Merchant Shipbuilding Company, and Union, Baltimore, and Quincy plants of the Bethlehem Shipbuilding Corporation, Bath Iron Works, and other eastern yards. They have

supplied the Navy with moisture-proof fans since 1910. This company also manufactures large motors which are used on hoists and winches.

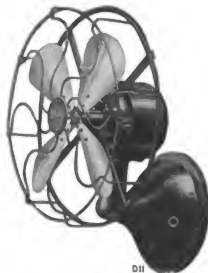
The Diehl fan is handled on the Pacific Coast by the Marine Electric Company, 195 Fremont street, San Francisco, California. The Marine Electric Company has recently received a carload of over 1000 fans to augment their stock so that they will be able to properly care for the requirements of all customers and particularly those using direct current fans. It is their intention to continually be in a position to make immediate delivery of the various types of direct current fans ordinarily required for a vessel's equipment. A complete stock of spare parts will be carried for all types.



Diehl two-blade cabin fan



Diehl flat blade ventilating fan



Diehl bracket fan



Diehl oscillating desk fan



Diehl bucket blade exhaust fan



γεννάω—I Produce!

ONE hundred and forty-four years ago Lavoisier coined the name *Oxygen*.

In choosing the Greek word γεννάω "I produce," as his main root he had in mind a chemical reaction commonly associated with the gas.

Had Lavoisier been able to foresee the tremendous part that Linde Oxygen is playing in modern industrial development, he would have realized the vast significance of that word γεννάω "I produce!"

The country over, Linde Oxygen is daily making possible greater production—everywhere it is saving time and cutting costs.

A chain of seventy-five Linde plants and warehouses assures American welders and cutters of a prompt supply of highly pure oxygen—wherever they are, whatever their requirements.

THE LINDE AIR PRODUCTS COMPANY

Carbide and Carbon Building, 30 East 42nd Street, N. Y.

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The Largest Producer of Oxygen in the World

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TRADE LITERATURE

The Union Engineering Handbook—Pumping Machinery, Air Compressors, Condensers. Compiled by P. Ordway, M.E., for the Union Steam Pump Company, Battle Creek, Michigan, U. S. A. 450 pages, bound in red seal with gold stampings.

This is a very handsome and most unusually complete handbook on the subjects covered as well as a catalog of the apparatus manufactured by the Union Steam Pump Company.

Section I of 88 pages covers the theory and practice of compressed air engineering and condensing, a great deal of very useful data on the cost of compressing air by the use of various fuels, on the practical calculation connected with installations in industrial plants, on the figuring of pipes for various purposes, and a highly instructive list of the uses to which compressed air is being put in modern industries.

Section II deals with centrifugal pumps, dividing them into two general classes, turbine and volute. This section, which covers 80 pages, forms a complete treatise on the design, manufacture and use of centrifugals. Full directions are given for installing, for figuring horsepower, costs of pumping, friction of water in pipes, and many tables of useful data concerning the flow of water through orifices, nozzles, hoses and hydrants. A very interesting table covering four pages gives the proper materials to be used in the manufacture of centrifugal pumps for handling various kinds of chemical liquids.

Section III occupies 64 pages and treats of condensers and condenser fittings. This section contains much useful data concerning the effects of dry, superheated and saturated steam on condensers in practical operation. It gives complete information concerning the physical characteristics of the various sizes and types of tubes used in condensers.

Section IV is devoted to electrical data and gives some very practical material on the theory and practice of direct and alternating current motors and electrical control equipment.

Section V treats of direct acting steam pumps. This section covers 120 pages, and gives complete practical detailed specifications for the design and manufacture of all classes and types for a very wide range of application.

Section VI is devoted to power pumps and crank and flywheel connected pumps.

In the appendix is carried a very useful collection of

tables as complete as will ordinarily be found in the best engineering handbooks. These cover the physical characteristics of iron and steel pipe, the properties of steam, factors of evaporation, various United States standards on pipe fittings, tables of logarithms and trigonometrical functions, circumference and areas of circles, etc., and a very complete and conveniently arranged

collection of tables of units and weights and measures with their conversion equivalents.

Taken altogether, this is a book that should find a very welcome place on the desk or book shelf of any engineer.

The Union Steam Pump Company are represented in the San Francisco district by Halloran & Golcher, with offices in the Sharon Building.

Efficient Marine Equipment Organization

MARINE and industrial power plant engineers who are interested in improving the equipment of their plants should pay a visit to the office of Halloran & Golcher in the Sharon Building and study the display of equipment which is on exhibit there.

Of particular interest is the full sized Radojet air pump cut on the center line so as to reveal the construction and principles of operation

of this modern method for obtaining high vacuums in steam condensers. A number of other interesting pieces of equipment are shown, and there is quite a collection of new catalogs and data books.

Halloran & Golcher are factory representatives in this district for condensers manufactured by the C. H. Wheeler Manufacturing Company; for Radojet and Rotrex vacuum pumps; for Kerr economy turbines and reduction

gears for turbo-auxiliary equipment; for Engberg generating sets and vertical engines; for the Union Steam Pump Company simplex and duplex marine type steam pumps; for the gauges, revolution counters, etc., manufactured by James P. Marsh & Company.

This firm is ready at all times to give prompt service and advice on marine equipment of all sorts and on industrial power plant equipment.

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To what extent the Lunkenheimers Company uses trade papers for advertising is shown in this chart, which is reproduced from a Lunkenheimer placard. Advertising of 1921 will be even greater. The Lunkenheimer organization evidently believes that the time of all times to advertise heavily is when business is slackest. An entirely new factory will be built by the Lunkenheimer Company near Cincinnati.



"NACO" *Electric* CAST STEEL ANCHOR CHAIN CABLE

*Meets every requirement of a dependable
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Strength—Tests show the tensile strength of Naco Chain to exceed that of ordinary commercial anchor chain cable, size for size, by over 70%. This great strength makes it possible to furnish Naco Chain to specifications 40% higher than those established on any other type of Anchor Chain Cable.

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Uniformity—The process of manufacture, by which each link of the same type and size is made off identical patterns, assures absolute uniformity in size and shape of links.

Permanency of Shape—The solid stud cast integral with the link, together with the inherent quality of Naco Steel, which enables Naco Chain to withstand excessive shocks without distortion, protect the permanency of shape of each link throughout the life of the chain.

Ease of Operation—Because of this uniformity and permanency in size and shape of links, Naco Chain always operates smoothly over the wildcat. The

casting of the stud solid with the link eliminates the possibility of loose or lost studs and assures against kinking.

Resistance to Corrosion—The corrosive action of salt water is less on Naco Steel than on other chain materials. In tests of long duration, Naco Cable lost less than half as much weight as wrought iron cable exposed to the same conditions. Its homogeneous structure resists the corrosive action, which eats into the fibre or laminations of wrought iron, in constantly increasing areas, and with deeper action than is visible, or can be measured.

Resistance to Wear—Naco Chain has superior wearing qualities. Because of its greater hardness (its Brinnell Number averages 260, as against wrought iron's 110) Naco Chain affords a correspondingly increased resistance to wear and abrasion.

Weight—In weight, size for size, Naco Chain is made the same as wrought iron; insuring the sag required for easy riding at anchor.

Official Rating—Naco Chain carries the official approval of Lloyd's Register of Shipping, American Bureau of Shipping, and the Bureau Veritas, and is furnished to their specifications.

THE NATIONAL MALLEABLE CASTINGS CO. CLEVELAND, OHIO

APPRAISAL OF TERMINAL PROPERTIES

IN the April, 1921, number of Pacific Marine Review Mr. H. McL. Harding, consulting engineer of the State of New York on barge canal terminals, presents an interesting article on the requirements a modern freight terminal should possess. Mr. Harding states:

"There is now arising a demand for terminal facilities for water-borne freight and this demand is not confined to any one section of the United States, but in front of nearly every ocean or inland city where there are inquiries for terminal locations by the Federal government, the states, municipalities, corporations, and private individuals."

He sums up the features which should influence the appraisal of terminal properties in a series of questions or statements and it is interesting to note how completely Berkeley's proposed harbor development plans—Pacific port terminal—meet these ideal requirements:

1. The size of the area as an undivided whole.

A. The situation on the East Bay water frontage presents the possibility of extensive terminal development extending as it does from the Key Route mole to the Contra Costa county line.

2. The length of the water frontage and its width in proportion to its frontage length. Certain relative proportions of the above lengths and width give the greatest value.

A. The length of this water frontage is about 25,000 feet. The average distance from the shore to the outer end is about 15,000 feet.

3. The position of the federal government pierhead and bulkhead line in relation to the whole property and the possibility of modification.

A. Both the pierhead and bulkhead lines are determined by the location of the four moles on the area and follow the quay walls of each.

4. The possibility of projecting suitable piers into the waterway and the number of piers and slips of commercial width that can be constructed.

A. Plans provide for four great quays or moles, each 300 feet wide and 13,000 feet long with basins 3000

feet wide between. Should necessity require, lateral piers could be constructed from these moles and not interfere with provision of ample turning basins for ships.

5. The present depth of water along the present or proposed quay line or piers and the depth required.

A. The present depth of water is about eight feet. By the dredging method for constructing the moles, however, water to the depth of thirty feet will be provided so as to accommodate deep sea vessels.

6. The number of cubic yards of dredging and the character of the bottom to be dredged.

A. Dredging for the initial development on the south side of the first unit amounts to about 4,000,000 cubic yards. The bottom to be dredged is covered on its surface with a blanket of mud, sand and gravel, the average elevation of which is about eight feet below mean low water level to the top of the mud. Underlying this blanket of soft material is a harder sand and gravel at an elevation of about 25 feet below mean low water. The character of the materials, together with the continuity of its stratification, permits favorable dredging operations.

7. The character of the subsoil and its pile sustaining power.

A. Considering the hard bottom to average 25 feet below mean low water and the depth to be pumped in channels 30 feet below mean low water (1) gives the first 17 feet of pumping in soft material and only 5 feet at the bottom in a harder material; (2) produces a very desirable hard bottom at an economical depth into which to found piles, both for creating a permanent bulkhead, giving it the necessary bottom to withstand great outward pressure and also for foundation purposes.

8. Is the construction of a marginal way of sufficient width for railway tracks and drayways feasible? The present drayage requires wider marginal ways.

A. Each mole or quay will be 3000 feet wide and ample room is provided for all necessary railway tracks and

roadways to serve all buildings and wharves.

9. Is there sufficient room for transit or transshipment sheds of proper dimensions parallel to the frontage of the quay or the pier?

A. With the width of 3000 feet for each quay, ample provision is given for necessary transit sheds and of almost any length which could possibly be desired, all arranged parallel to and adjoining the wharves.

10. Can warehouses or manufacturing lofts be constructed in correct relation to the waterfront or the transit sheds?

A. Each mole provides a land area of 1500 acres and the plans call for construction of warehouses immediately back of and connected with the wharves and transit sheds. Factory sites are also provided and none of the warehouses or factories will be more than 1500 feet from the wharves, all co-ordinated in such a manner that the necessity for using freight cars in moving commodities between ships and factories or warehouses will be practically eliminated.

11. Are there good roads affording easy rail or dray approaches to the terminal?

A. The plans call for well paved roadways to all industries located on the terminal, as well as to the wharves. There are now excellent street approaches from all east bay cities and the interior. Railway connections with all transcontinental lines lead direct to all industries located on the terminal and alongside the wharves. At an exterior portion of the quay, ferry facilities are provided for railroad car floats, as well as for passenger and vehicular service.

A large railroad yard is provided near the shore end of the quay and all cars coming to the various portions of the quay must first pass through this yard. Trains can be brought in from the east, classified and routed for the various industries and storage buildings or for shipping, and provision is also made for the classification of particular commodities coming in from ships, the warehouses or from factories. Freight coming to the yard would there be classified in so far

as possible into carlots and broken into trains for various railroads. Another yard for the car float service is located at the outer yard.

Railroads will deliver trains into the terminal yards.

Operation on the terminal itself will be under the control of the terminal company, thus affording equal and uniform service.

12. Can there be railway tracks or drayways along the waterfront so as to secure the all-important co-ordination between vessel and the shore?

A. The answer given to question 11 fully answers this also.

13. How many ship or barge units can be laid out along the available water frontage?

A. One unit provides 35,000 lineal feet of quay or berthing space for 70 ships of 500 feet each, at one time.

14. What is the possible space for bulk or coarse freight?

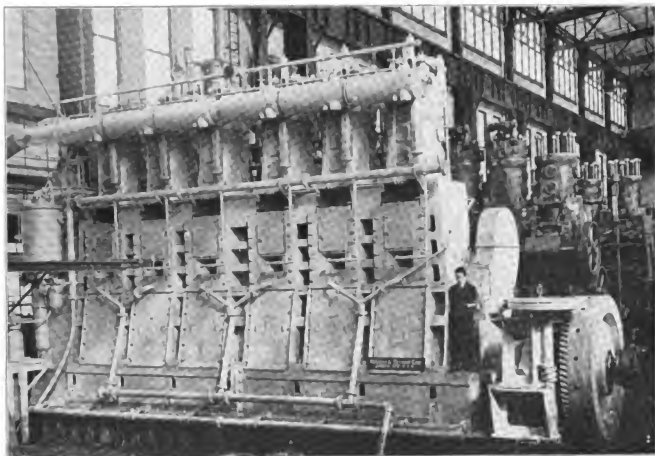
A. On the southerly side of the outshore end is provided a coaling station, either for bunkering ships or for loading cargo coal, and in this location will be provided storage space for oil, which may be led through pipes along both faces of the quay so that ships may be supplied with oil while they are loading other commodities. Grain elevators are provided on the north and south quays with certain separate yards for the direct loading of grain into vessels, and from these grain elevators, conveyors may be planned to run along the face of the pier sheds above the roof where desirable, so that ships may be loaded with grain at any point along the commercial quay front.

An area is reserved for the handling of lumber which may come in by rail from the interior and may be loaded directly out of cars into ships or from ships to cars, or may be stored temporarily and then loaded into ships. For this purpose heavy gantry cranes are planned, serving the lumber area.

15. Annual tonnage transferring capacity per lineal foot.

A. Three hundred tons or more.

16. Character of the soil to the rear of the bulkhead



The above picture shows one of our 1200 I. H. P. Directly Reversible Marine Engines on the test floor. A pair of these engines have been installed on the M/S "KENNECOTT."

Other sizes available for Marine work, 390, 640, 1550, 2000 and 3000 I. H. P.
all four cycle and directly reversible.

DIESEL TYPE MARINE ENGINES HEAVY DUTY

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AUBURN, NEW YORK

149 BROADWAY
NEW YORK

412 BISBEE BLDG.
JACKSONVILLE, FLA.

815 SHELDON BLDG.
SAN FRANCISCO, CAL.

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in respect to securing stable foundations for superstructures.

A. All of the area provided for industries is filled in land capable of sustaining any weight desired. See answer to question 7.

17. Determination of the best type of superstructure, whether of the crib, concrete wall or relieving platform type.

A. Plans call for dividing the warehouse buildings by fire walls into sections 150 feet by 50 feet and this has been considered good practice for this class of building.

The floor loading provides the following: The ground floor being directly on the fill would be susceptible of any weight to be determined by the character of the fill. The second and third floors should be designed for 300 pounds per square foot and the floors above that 250 pounds per square foot.

The height of the floors will be: first floor, 15 feet in the clear, and floors above that 12 feet in the clear.

The wharf shed is designed for 500 pounds per square foot on the first floor and 300 pounds per square foot for the second floor. The first floor will have a clear height of 20 feet and the second floor a clear height of 16 feet.

The factory buildings are designed to be 30 feet wide, which is considered sufficiently narrow to operate in industries without artificial lighting. The floors will have a live load of 200 pounds per square foot with a clear height of 16 feet.

Automatic sprinklers are provided through the entire district. Tanks for fire protection and auxiliary pumps will be installed with high pressure fire service lines and hydrants at frequent intervals on the entire property.

18. Distance from the civic centers for the origin and consumption of freight.

A. All of the east bay communities—Alameda, Oakland, Emeryville, Berkeley, and Albany—may be considered as a commercial unit. All of the industrial sections of these communities are within easy trucking distance of the terminal and in no case exceed ten miles; the greater portion are considerably less than this. The distance from the Oakland city hall, which may be con-

sidered as about the center of the industrial section, is but 5.1 miles from the terminal; industries located along the Oakland estuary, on the western waterfront and in East Oakland, are slightly further away than this; those located in Emeryville, Berkeley and Albany are much nearer. Well paved roads from all industrial sections lead directly to the terminal.

19. Sewers, slaughterhouses and other nuisances may have an influence on terminal values.

A. The zoning laws of the municipality prevent the possibility of any obnoxious industries or nuisances being located on the property.

20. For comparison with adjacent waterfront sales, such properties must be similarly situated with like physical characteristics.

A. In Oakland—the western area of the city—land ranges from 10 cents to \$1 per square foot, according to proximity to rail and water transportation; along the inner harbor prices range from \$1 to \$2.50 per square foot; in East Oakland the values run from 75 cents to \$2 per square foot, all either served by rail or water transportation, or both. The amount of such land available, however, is very limited.

21. The nearness of the terminal to elevated, subway or trolley lines and the proximity of a labor market have an important influence on its value.

A. Trolley lines leading from the terminal reach all of the east bay cities—Berkeley, Oakland, Albany, Alameda, Richmond, and Hayward. Ferry lines operate direct to San Francisco and to other points around the bay.

The unusual situation prevailing because of the proximity of the various municipalities—San Francisco, Oakland, Berkeley, Alameda, Albany and Richmond—produce a labor supply not found in communities the size of the one in which this terminal is located—i. e., Berkeley. The available labor supply therefore can be measured by the population of these closely interlaced districts: Alameda county, 344,127; San Francisco, 506,676. In this connection it

may be noted that within a zone of 100 miles from this terminal reside 1,500,000 persons and that this is the exact center of the population of the Pacific Coast. Fifty per cent of the residents of the east bay district own their own homes.

22. The value is also increased if the property is practically necessary to the municipality or to some company or individual other than the owner, for a contemplated improvement.

A. The entire enterprise is one in which the municipality of Berkeley has a direct share in its revenue, as the lease provides that the city of Berkeley shall receive one-half of all the profits accruing from the collection of wharfage charges on the portion of land leased from the city.

23. Its value is also dependent upon its nearness to barge, lighter or harbor craft traffic.

A. Barge, lighter and other harbor craft is able to operate direct from the terminal to any portion of the bay. River boats from Sacramento and Stockton here find their first landing place.

24. The size of the population, of its hinterland and their consuming capacity, and the volume of tonnage and value of the traffic passing by its waterfront, should affect its appraisal value.

A. Directly opposite the Golden Gate are situated the east bay cities. Immediately back of these cities lies a range of low hills, making one of the most delightful residential districts on the Pacific Coast. The bay, some fifty miles in length, stretches from the north to the south and is enclosed by two jutting peninsulas, the one to the south containing the city of San Francisco proper. The northern peninsula, by far the more rugged, is wholly unsuited for commercial development. The east bay cities, located directly in the center of the continental side of this expanse of water, are directly opposite its only accessible entrance from the sea.

The bay at large is most admirably fitted for commercial development, but a casual glance will disclose that the most intensive development at present—namely, the city of San Francisco itself

—is isolated from the continent by the very bay which makes its development possible. The east bay cities, however, it can be said without fear of contradiction, possess the most strategically located sites for commercial expansion. On the transcontinental side of the bay, harboring four of the termini of the transcontinental rail carriers, the east bay cities are the western gateway for the railroads for central United States.

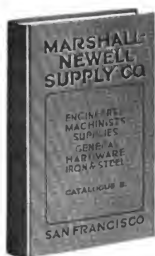
According to the 1920 census, California ranks eighth in population among the states, showing a gain of 44.1 per cent over 1910—a total population of 3,426,536. Nine counties surrounding the bay of San Francisco have a population of 1,184,000. Other sections of the state also have their outlet through the bay of San Francisco with populations as follows: San Joaquin Valley (eight counties), 425,000; Sacramento Valley (nine counties), 214,000; Northern California (five counties), 73,000, which together with the population immediately adjacent to the bay make a population of 1,896,000 directly contributory to this locality.

The tonnage handled over the piers at San Francisco now approximates 10,000,000 tons annually. It is conservatively estimated that at least 50 per cent of this now originates or is destined to points on the mainland side and passes by Pacific port terminal and the unnecessary expense and delay caused by transporting this tonnage across the bay or making a long detour is now charged against it.

25. The elevation of the land terminal area, whether level or on grade, whether it should be excavated or filled, and what expenditures would be necessary to make the land area suitable for terminal purposes, should be considered in the appraisal.

A. The great value to land on Pacific port terminal is the fact that it is all filled, all level, and no expense is incurred in leveling or cutting down land, which because of physical characteristics is unsuited for industrial purposes until this is done. Also the land is made at the same time as the channels are dredged.

Trade Literature



Catalog B, Marshall-Newell Supply Company, San Francisco.

The Marshall-Newell Supply Company have issued a very handsome book in this general catalog. It covers 750 pages, completely indexed, and with very numerous cuts, all bound in green buckram with red and black stampings. The Marshall-Newell Supply Company are factory representatives in San Francisco for the following firms: The Lunkenheimer Company, Yale & Towne Manufacturing Company, Ashcroft Manufacturing Company, Reed Manufacturing Company, Greenfield Tap & Die Corporation, Durabla Manufacturing Company, Heller Brothers Company, Consolidated Safety Valve Company, The Penberthy Injector Company, Wahlstrom Chuck Company, Open Coil Heater & Purifier Company, Joseph Dixon Crucible Company, Oliver Ames & Sons Corporation, Foster Engineering Company, Toledo Pipe Threading Machine Company, Armstrong Brothers Tool Company, E. C. Atkins & Company, Norwalk Lock Company, Youngstown Sheet & Tube Company, Penn Oiler Company, Hayden & Derby Manufacturing Company, Jenkins Brothers Company, Peck, Stow & Wilcox Company, Taylor Instrument Companies, Joyce-Cridland Manufacturing Company, L.

S. Starrett Company, Cleveland Twist Drill Company.

Bulletin No. 330, The Grissom Russell Company, describes the Reilly submerged type self-sealing evaporator.

As long as evaporators have been used for distillation of sea water to provide boiler feed make-up on ship board, the cleaning of salt scale accumulations from the coil surfaces has been both a problem and a nuisance. This scale is sure to form as a result of evaporation and its presence decreases materially the rate of heat transfer from the steam in the coils to the salt water in the shell and therefore scaled coils decrease the evaporator capacity. When a ship reached port it was necessary for the chief engineer to open his evaporator and clean the coils either by hammering them to crack the scale off, or by heating them in a charcoal fire.

The radical differences between the Reilly evaporator, submerged type, self sealing, and all previous evaporators of various makes, and which differences account for the self sealing feature, are the following:

1. The Reilly evaporator, submerged type, self sealing, is equipped with the new patented enveloping baffle, which is the only device allowing the tube surface in a salt water evaporator to be entirely submerged. Without this baffle it is necessary to have the greater part of the tube surface above the water level in order to dry the foam out of the salt water vapor.

The entire coil surface being submerged causes the scale on the coils to be kept moist and effectually prevents the baking on of the scale, which was the principal trouble heretofore.

2. The pitch of the convolutions of the coils is designed to exaggerate the expansion and contraction movement. This pitch has been carefully determined by exhaustive experiments.

PRATT & WHITNEY STAYBOLT TAPS

TO MEET all your boiler requirements, we build P & W Staybolt Taps in five standard styles, as well as Spindle Staybolt Taps with and without threaded end and also Combined Reamer and Tap to tap continuous hole in the reamer hole of the far boiler plate.

Our reputation for precision and high quality stands behind these tools. Buy them in any of the styles and sizes listed in our Small Tool catalogue which is yours for the asking.

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OPERATORS, ATTENTION!

A PRETTY row is in prospect between the merchants who make it a business of supplying steamships, the paint manufacturers, the rope manufacturers, the steam packing manufacturers, and the steamship companies operating government ships, on the one hand, and the Shipping Board on the other hand, over the method of purchasing supplies and equipment for these ships.

This row has been brewing for some months past, and was brought nearer to a head on Tuesday, April 26, when the bids of various paint manufacturers for the supplying of paint for government vessels operated by American Steamship Companies, were opened by the Shipping Board in Washington.

Among the bids was one from the Durham-McQuade Paint Company, a subsidiary company which manufactures marine paint and which is owned by the John McQuade Company, with offices at 7 Pine street, New York, and factory in Brooklyn, New York. The Durham-McQuade Paint Company refused to bid on a paint according to the specifications of the Shipping Board, and offered paints of their own manufacture and which have been commonly used by steamship companies for years. A protest was entered by the company signed by its president, Robert W. Swan, Jr.

Mr. Swan denounced the specifications, stating that a paint manufactured in accordance therewith was absolutely unfitted and unsuitable for use on shipboard. In his protest he said:

"After a careful study of the Shipping Board's paint specifications, and a report from chemists as to the character and quality of a paint made up according to the specifications, we can

commend, and will recommend, the Shipping Board's paint to be of a splendid quality for painting houses, chicken-coops, barns, out-houses, cellars, pantries, kitchens, attics, and even wooden fences, but for shipboard purposes we feel certain it will be anything but satisfactory."

The entire protest was an attack upon the system of purchasing supplies under contract, as is being employed by the Shipping Board, Mr. Swan claiming that this was a wasteful, extravagant, and unbusinesslike method, especially to contract for supplies months in advance, while the market has been steadily receding. As an example of the evils which he claimed savored very much of those existing during the war period,

on his appointment to the Shipping Board.

One of the stories told concerns the S. S. John Adams which was placed in Jahneke's Dry Dock, New Orleans, where her bottom was painted. She sailed for Pensacola, Florida, a distance of a few hundred miles, and upon entering the harbor, suffered an accident and was compelled to put back to New Orleans where she went into dry dock once more, to have her plates straightened, when it was discovered that in less than three weeks' time all of the paint on her bottom had been washed off, necessitating a repainting, according to the report of her master. Shipping men say this is but one of many instances in connection with Shipping Board contracts.

In the protest it was pointed out that the contract system opens up opportunity for political manipulation, and the creation of thousands of political sine-

This they have sent to every supply dealer in the United States, as well as every member in Congress, or other government official interested, and to all steamship companies asking them all to co-operate in doing away with this expensive, extravagant contract system and permit steamship companies to operate government ships under what is known as a "bare boat charter." This means that the government allocates to various steamship operators vessels of government ownership at a specified charter price, and the operators pay for their upkeep in accordance with the terms of the charter and operate them in the same economical manner that they operate the privately owned vessels.

Owing to stagnation in the shipping industry, those companies that were organized overnight for the purpose of securing government

	Steamship Company	Shipping Board
	Pays	Contract Price
Marine engine oil.....	\$0.62 per gallon	\$0.72½ p. g.
Cylinder oil.....	0.57 per gallon	0.72½ p. g.
Ice machine oil.....	0.45 per gallon	0.47 p. g.
Flax packing.....	0.40 per pound	0.80 p. p.
H. P. steam packing.....	1.30 per pound	1.60 p. p.
Sheet rubber packing.....	0.40 per pound	0.48 p. p.
Gaskets.....	1.00 per pound	1.05 p. p.
Semi-metallic packing.....	1.50 per pound	1.80 p. p.
Asbestos sheet packing.....	0.55 per pound	1.30 p. p.

ed, he quoted upon a number of articles required by steamship companies, and on which the Shipping Board had entered into contracts with manufacturers, quoting the prices paid by steamship operators through their own purchasing departments in the open market of qualities time tried and entirely satisfactory and for the same materials quoted prices being paid on Shipping Board vessels under Shipping Board contracts the period being from November 1, 1920.

In his criticism of the contract system he referred to the bottom paint contract, which caused such dissatisfaction among the shipping companies. It is believed that this paint was furnished by a paint company in which was financially interested one of the members of the Shipping Board, who resigned his official position with the paint company up-

cures for so-called inspectors, investigators, surveyors, and other impedimenta, all of which will lead to delays in the speedy dispatch of ships, and a day's delay means a loss of \$1500 or more on each ship, all of which adds to the operating cost of the ships and handicaps the American merchant marine in its attempt to compete with the more economically operated ships of other countries.

The Durham-McQuade Paint Company, in addition to their protest to the Shipping Board, have taken up the fight in behalf of the steamship operators, and supply dealers. They have incorporated their protest into a circular headed in large black type "The Shipping Board Demand House Paint for Ships, Why Not," and then shows the picture of a house, surrounded by a question mark, after which follows their protest.

vessels through political influence, have gradually fallen by the wayside, failed in their obligations to the government, and in many of our harbors may be seen dozens of Shipping Board vessels tied up to the piers or anchored in the bay, without cargo and many without operators. In Jamaica Bay, there are almost sixty vessels, and it has been announced that there soon will be seventy-five. The Shipping Board claim savings in wharfage through anchoring them in Jamaica Bay, but neglect to say anything about the losses on the vessels overhead, due to their idleness, and unbusinesslike policy of the Shipping Board. The steamship companies are strongly organized and are prepared to back up the protest of the paint company and make this contract an issue, due to the very impracticability of the specifications and contract itself.

Trade Literature

The Precision Truing Machine. Bulletin No. 21 of the Precision Truing Machine & Tool Company, Inc., Cincinnati.

A four-page leaflet describing Style No. 21 of the Precision truing machine. This device consists essentially of a spindle mounted on ball bearings with a heavy flywheel on one end and a small grinding wheel on the other. The bearings and flywheel are enclosed in a dust-proof and waterproof aluminum housing.

In truing up an emery wheel this machine is bolted to the table of the grinding machine and the face of the small wheel on the truing device is brought in contact with the face of the large grinding wheel while the grinder is running. The action of the two wheels running together in this way trues up and dresses the grinding wheel and produces a finish which is said to be superior to that produced with the ordinary diamond device. The only expense connected with its operation is for replacement of the truing emery wheels, which is very nominal.

Portolift—Portable Electric Stacking Elevator. Allan Cunningham Company, Inc., Seattle, Washington.

An eight-page bulletin profusely illustrated describing a portable electric elevator or tiering machine which is designed as an attachment for an electric storage battery platform truck and can also be furnished as an independent portable unit mounted on its own four-wheel wagon type truck. In the latter case the mechanism is called a portable tiering elevator.

The great advantage claimed for this machine over other types is that of no projecting wheelbase or body on the front of the platform guides so that the elevator platform itself can be lowered until it rests flat on the floor or platform on which the machine is working. With a bevel edge it is possible with the elevator platform in this position to wheel loaded hand trucks directly onto the platform and to lift them bodily with their loads. This feature of course greatly facilitates the unloading and loading of freight cars and the placing of heavy pieces on upper tiers on platforms in warehouse.

Both types of the machine can be furnished with lifting capacity from 800 to 4000 pounds with hoisting speeds of 15 to 60 feet per minute. They can be fitted with either direct or alternating current motors for plugging into dock or warehouse mains or with low voltage direct current motors to take the current from the stor-

age batteries of the electric truck.

Two of these machines have been in operation on the docks at Seattle and have been found to be so satisfactory that the Port Commissioners have ordered enough additional machines to serve all of the main aisles of their warehouse. It is estimated at Seattle that these machines pay for themselves in a very short time in the reduced labor costs of stacking cargoes and the possibilities of saving valuable floor space by higher tiering.

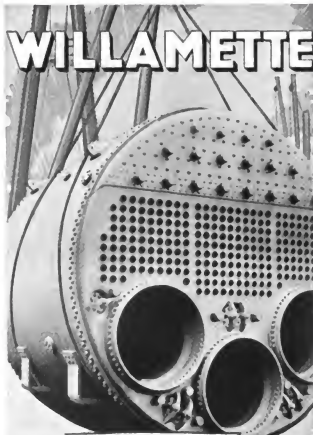
Threads—Volume X, No. 2. Shop organ of the Geometric Tool Company, New Haven, Connecticut.

A very neat book of 20 pages devoted to the interests of the employees of the Geometric Tool Company and setting forth in a very interesting manner on some of its pages the advantages of shop work with the geometric die head.

Liquid Fuel Burners for Open Hearth and Other Regenerative Furnaces. Bulletin L.F.-101 of the George J. Hagan Company, Pittsburgh, Pennsylvania.

The George J. Hagan Company of Pittsburgh maintain a service covering the entire field of industrial heating, particularly in that aspect of that field which has to do with fuel application. The application of liquid fuel in the industries has rather indefinite boundaries. There are some operations where no other fuel will be considered and then there are many operations where liquid fuel would be considered only as an auxiliary to solid or gaseous fuel. Often the application of oil is attempted in operations where from every standpoint of engineering other fuels would be very much better. It is, therefore, the desire of the service of the George J. Hagan Company to carefully analyze every individual problem and give their clients the benefit of their long experience in the application of the various fuels.

The present booklet describes Hagan liquid fuel equipment as especially adapted to open hearth furnaces. This equipment includes burners of the swinging type and the Hagan flow control stand. The burners are applied to the ends of the furnace and the flow control stand is mounted on the clarging platform. The function of the control stand is to permit convenient reversal of the firing from one end of the furnace to the opposite end or the suspension of operation entirely. Included also is the Hagan open hearth line is a ladle heating burner.



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The Lillie Evaporator. Bulletin No. 114 of the Wheeler Condenser & Engineering Company, Carteret, New Jersey.

In this 25-page booklet are described in considerable detail the features peculiar to the Lillie evaporator and several installations for sugar work, distilling water, and for evaporating many kinds of chemicals, solutions and waste waters. The solution is forced to the top of the body of an effect and evenly distributed over the outside of the tubes in which the moving films. Thus all of the available temperature difference is utilized for causing heat transmission and an unusually high rate of heat transmission is attained. Incrustations are taken care of by mechanical removals of both vapors and liquids through the effects. Those interested in the production of distilled water for boiler make-up feed on shipboard and in power plants will be interested in the description of the Lillie six-effect evaporator plant at the U. S. S. Tennessee and California. A perspective diagram is also given of the triple effect and auxiliaries recently installed at the power station of the Chile Exploration Company of Tocopilla, Chile.

Specifications—Bituminous Anti-Corrosive and Water-Proof Coatings for Iron, Steel, Concrete and Wood—Asphalt Mastic and Composition Floorings. Hill, Hubbell & Company, San Francisco.

An attractive cover of the loose-leaf variety enclosing bulletins No. 1, No. 2, No. 3, No. 4, and No. 5, of Hill, Hubbell & Company. Bulletin No. 1 is a questionnaire setting forth facts about Biturine Enamel and Biturine Solution is a question and answer form.

Bulletin No. 4 sets forth the advantages of Biturine protective coatings for marine use. From the years 1916 to 1920 inclusive, Biturine was used on a total of 455 ships built on the Pacific Coast for the United States Navy and for the Emergency Fleet Corporation.

Bulletin No. 2 shows the economy through the use of Biturine as a protective coating for water tanks, as evidenced by its application to the surfaces of over 200 water storage tanks in the metropolitan district of San Francisco.

Bulletin No. 3 advises the use of Biturine protective coatings for underground pipe lines. The Ozark Pipe Line, running 430 miles from Cushing, Oklahoma, to East St. Louis, Illinois, coated by Biturine solution after exhaustive tests by the contracting engineers, Sanderson & Porter, is functioning perfectly under the protection of Biturine and many hundreds of miles of gas mains, hydro-electric and irrigating installations, and wa-

ter piping throughout the western part of the United States are enjoying immunity from rust and corrosion through the wise provision of this protective coating.

Bulletin No. 5 is devoted to the subject of Vulcanite Mastic Flooring. Mastic might properly be called a bituminous concrete.

As an acid and alkali resistant it has an extensive application for the flooring of battery rooms and for the lining of concrete, metal or wooden tanks. It also has an extensive application for the roofs of hotels, apartments, stores, factories, schools, or any roof spaces which are used for recreation or business purposes. It may be laid with the trowel and economy on a previously placed floor of wood, concrete or brick, the only requisite being that the material upon which it is laid shall be solid with no great vibration.

Winton Marine Oil Engines. Winton Engine Works, Cleveland, Ohio.

A 34-page art brochure, beautifully illustrated with Winton engine vessels of various types equipped with the directly reversible Winton marine Diesel and also with the Winton-Westinghouse Diesel electric drive. The detail of construction of this serviceable oil motor is shown pictorially and described in text. The engines are built in 3, 4, 6 and 8 cylinders with horsepower from 50 to 450. The four smaller sizes are fitted with reverse gears; the three larger sizes are self-reversible.

Winton Diesel Oil Engines—Commercial Type. Winton Engine Works, Cleveland, O. An eight-page booklet describing the non-reversible Winton Diesel oil engine for direct connection to electric generators. Complete specifications, dimensions and weights of the engines are given.

Winton Air Compressors.

A four-page folder describing Winton-built air compressors. These compressors are put up in four types: Model W-18 geared to an electric motor mounted in line with compressor on the same bedplate; Model AC-3 driven by a twin cylinder steam engine directly connected and mounted on the same bedplate; Model AC-3 with bedplate adapted for electric motor drive through silent chain gearing; and Model W-18 driven by a 6-cylinder Winton gasoline motor mounted on the same bedplate and geared down to compressor speed.

Gasoline Marine Engines. Winton Engine Works, Cleveland, Ohio.

An eight-page folder describing the Winton gasoline marine

engine, in 6 and 8 cylinder sizes, in horsepower from 80 to 200, with special planetary type reverse gear, all gears and pinions being of chrome vanadium steel. These engines are all equipped with the Winton air starter, with Bosch coil magneto and battery current, and a high tension magneto working on high tension plugs, giving two independent and complete systems of ignition. Lubrication is worked entirely on the pressure system, and oil is filtered through a series of easily removable screens in the circulation system.

The Pneumercator Afloat. Pneumercator Company, Inc., 118 Liberty Street, New York.

A 26-page booklet describing and illustrating the uses of the Pneumercator on shipboard as an instrument of precision for indicating the fore and aft draft and registering the main draft and displacement. The Pneumercator is usually located in the captain's office on a ship and is an accurate check on the weights carried in cargoes and bunkers. The instruments are practically "foolproof" and provide means in themselves of proving absolutely the accuracy of the own readings. They are extremely valuable to a navigating officer in that he has under his eye constantly and accurately the trim and list of his vessel under all conditions.

The Pneumercator Ashore. Pneumercator Company, Inc., 118 Liberty Street, New York.

An 18-page booklet describing the application of the Pneumercator as an instrument of precision which will indicate the level and the weight or volume of any liquid in any tank, stand pipe or reservoir. The Pneumercator also has been variously used in measuring the depths of rivers, stages of tide, etc., of water flow over dams, and many other similar purposes.

Steering Gear Catalog. American Engineering Company, Philadelphia.

A 30-page book with artwork covers describing and illustrating the various steering mechanisms manufactured by the American Engineering Company. Hand steering gears, mechanical, hydraulic and electric transmission systems, steam gears for mechanical transmission, hand and steam gears for mechanical transmission, screw gears, differential gears, steam tillers, steering gears, and electro-hydraulic, are all described and their best use indicated.

Instructions for the Care and Operation of the American Automatic Towing Machine. Bulletin No. 107 of the American Engineering Company, Philadelphia.

A four-page leaflet giving the working drawings of the tow-

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ing machine and winding device with printed notes of direction for installation, for winding the rope on drum, and for setting the machine for towing, together with various instructions on different methods of towing and on lubrication, upkeep and repairs.

Ideal Pump Governor. Bulletin No. 1-A of the Atlas Valve Company, Newark, N. J.

A 12-page booklet describing the various styles and types of the Ideal pump governor, which

is described as a "piston actuated pressure controlling valve for governing either reciprocating or turbine driven pumps."

This governor varies in style according to whether the pressure desired from pump is fixed or variable. The actuating piston of the governor works in an oil bath, the body of oil not only lubricating the piston but preventing the liquid from entering the control cylinder, thus eliminating any possibility of the sticking of the piston due to corrosion or sediment.

There are only two moving parts, the steam valve, which is of the double seated balanced type, and the control piston; no diaphragms, cup leather packings or small delicate parts to get out of order.

London's Life Saver and Ship Recoverer. C. E. London, Vancouver, B. C.

A booklet of 16 pages describing a newly patented device designed by C. E. London and illustrated with artist's sketches showing the applica-

tion of this device on wrecked ships.

The device consists of a buoy which upon the sinking of the ship is released automatically but is still attached to the ship by a light cable which unwinds from a drum. The end of the light cable is attached to a heavy cable, this heavy cable being solidly attached to the framing of the ship and clearing itself from the drum when completely unwound. In the buoy are stored food, water and clothing. When the ship sinks,

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the buoys varying in number according to the size of the vessel, float on the surface, unwinding their cables as the ship sinks. The survivors finding refuge on the buoys, by opening the hatch, obtain access to the food, clothing and water, and are thus enabled to comfortably survive the rigors of shipwreck for a very considerable length of time. The survivors being picked up, the buoys are left to mark the location of the wreck. Upon the arrival of the salvage vessels the buoys are picked up, the light cable is hauled in, followed by the heavy cable, which is then attached to the cranes on the salvage lighters and the sunken hull hoisted to the surface.

G-R Regenerative Compressor.

Bulletin No. 350 of the Griscom-Russell Company, 90 West street, New York.

A 12-page booklet describing the use of an auxiliary for evaporators.

Evaporators installed on shipboard have to be of a size suitable for the maximum distilled water requirements, but there are many periods when the vessel is operating under reduced speed or is in port, during which this maximum evaporator capacity is not needed. Quite frequently the reduced requirements are as low as 25 per cent of the rated evaporator capacity.

The G-R Regenerative Compressor installed on an evaporator gives increased efficiency by compressing and delivering to the evaporator coils a portion of the vapor taken from the evaporator, thereby reducing the total steam required for evaporator operation. The latent heat contained in this evaporator vapor would ordinarily be thrown overboard in the distiller or condenser circulating water.

The compressor is so installed that with the evaporator working at full capacity the compressor may be cut out through a bypass system by the manipulation of the valves. The compressor is of the jet flow type.

Development of Electricity in the Merchant Marine. The Cutler-Hammer Manufacturing Company, New York.

A 16-page beautifully illustrated booklet describing the use of Cutler-Hammer electrical apparatus for the application of electricity to the driving of the auxiliary machinery on board ship. The Cutler-Hammer Manufacturing Co. is probably the oldest manufacturer of electric control equipment in the United States. Their experience in the marine field began with the early use of electrically driven machinery in the United States Navy, and in the design of control apparatus for



marine use they have had probably a wider and longer experience than any other manufacturer in the United States.

Marine Geared Turbines for Merchant Ships. Bulletin No. 49015 of the General Electric Company, Schenectady, N. Y.

A forty-page beautifully illustrated and printed book with art cover describing the advantages of the General Electric system of marine geared turbines for merchant vessels of 2000 to 4000 S. H. P. The Curtis steam turbine as manufactured by the General Electric Company is described in detail with working diagrams showing action of steam and detailed drawings showing the entire construction, both of turbine and gearing. The double reduction gears of the General Electric Company are described and numerous drawings displayed showing the development of the teeth forms and the construction of the hollow quill pinions, and flexible shafts and couplings with detailed sectional drawings. A very instructive and interesting report on the operation and manufacture of the turbine and gears.

Howden's Forced Draft. Bulletin No. A-2. James Howden & Company of America, Wellsville, New York.

An eight-page folder giving general specifications for the Howden forced draft system, including the fan, fan engine, furnace fronts, and ducts. How-

den's system has become almost standard in high pressure marine installations. As is pointed out on the cover page of this folder, Howden's forced draft is fitted to the largest and fastest steamers in the world, including such ocean grayhounds as the Leviathan, the Imperator, the Aquitania and the Mauretania, each of which has in excess of 60,000 S. H. P. in its ahead turbines.

Fulton Diesel Oil Engines. Fulton Iron Works Company, St. Louis, U. S. A.

A 35-page bulletin describing in detail the principal features of the Diesel engine manufactured by the Fulton Iron Works Company, which is a development from the original designs and patents of Franco Tosi of Legnano, Italy. The Tosi engine has been described more than once in the columns of Pacific Marine Review. It is a vertical multi-cylinder 4-cycle engine with an A-frame construction and all of the bearings accessible even while the engine is in operation.

Special emphasis is laid on the perfection of the lubricating system and the starting mechanism in these engines. The lubricating system consists

of gravity sight feed to the main journals with centrifugal ring fittings on the crank pins. The piston pins are lubricated by forced feed under sight feed control. The cylinders are lubricated by multiple forced feed oilers driven from the camshaft with from two to four individual feeds to each cylinder.

In the starting of the Fulton Diesel oil engine the valves proper are of simple construction actuated by compressed air and permit centralization of the entire control of the engine in one hand wheel conveniently located. To start the engine this hand wheel is turned to the first starting position, permitting high pressure air to pass to the starting valves opening them in proper sequence. Only two of the cylinders are equipped with starting valves. After a few revolutions under air, the hand wheel is moved to the second starting position which puts in action the fuel pump plungers for the other two cylinders, leaving air on the starting cylinders. When the engine has taken its first impulse from the fuel, the hand wheel is turned further to the running position, automatically cutting off the starting air and putting the two starting cylinders under fuel.

"Little David" Wire Brush Cleaner

WIRE brush cleaning of metal surfaces offers an opportunity for considerable saving of time and labor over that required by hand in removing paint, rust, scale and dirt. However, it has been difficult to obtain a wire brush of proper design and materials which would work effectively on an air motor and not wear out too rapidly.

A wire brush of very rugged design has recently been placed on the market by the Ingersoll-Rand Company, 11 Broadway, New York, for use with its standard No. 6 "Little David" drill. It is a brush with face diameter of five inches and is made up of wires of a special heat treated steel which has been found to have very good wearing qualities. It is sturdily constructed and will stand up under severe service.

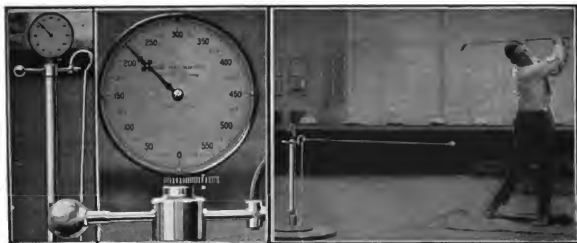
It is manufactured particularly as an attachment for the No. 6 drill (as illustrated), this type of machine being especially suited for work of this nature. The drill has liberal bearings to take up all the end thrust when pressing down on the work; a high speed and very reliable motor, and moreover is of light weight and small overall dimensions. It can be used in sharp corners and other cramped spaces. The whole outfit weighs only 11½ pounds.

The wire brush outfit is adapted for removing paint,

rust, scale and dirt from tanks, steel cars, structural steel and all sheet metal surfaces. It is very useful for cleaning iron, steel and aluminum castings.



A NEW DECK PASTIME



Maurice F. Mc McLaughlin, the "Comet" of international tennis fame, playing golf on the Craig Golfmeter on top of the Dyas building in Los Angeles. Inserts at left show details of gauge and column

AFTER having seen the new Craig golf machine in operation, it seems to us that the operators of passenger steamships who do not install at least one of these machines on deck are overlooking a very good method of providing pleasurable pastime for passengers and possibly added revenue for themselves.

Captive Ball

The Craig golf machine has come into wide use among golf players, both for private practice in their own room or yard and for public use at golf clubs. As shown in the illustration, the machine is a captive ball device. It uses a regulation golf ball attached to a cable, the other end of which is held by a pulley traveling on a highly tempered spring steel wire trolley pivoted on the vertical stand so that when the ball is struck by the club it travels in a circle around the stand, working on practically frictionless ball bearings and balanced by a counter weight. The bearings carrying the trolley are geared to the gauge dial so that the yardage of the ball is recorded, each revolution amounting to ten yards in actual distance.

With the aid of a putting cup and with the particulars of any golf course at hand, contests can be played out with this machine between players approximating very closely the actual conditions of straight drive playing on the links. Many of the best professionals use the machine to keep themselves in practice.

chine to keep themselves in practice.

Small Space Needed

It is very easily assembled, stands 33 inches high, and weighs 25 pounds. The space necessary for the full use of the machine, including the swinging of the club, is approximately 11 feet by 16. Free space of this size is easily obtainable on the decks of the majority of passenger liners, and there is no reason why the golf enthusiast should not take his links to sea with him. For straight driving and for achieving that form to which all would-be golfers aspire so earnestly, practice on the machine is much more easily acquired and under conditions more suitable for concentration on the work than is possible on any public golf links.

Professional Endorsement

MacDonald Smith, a nationally known professional, says of the Craig golf machine that "it is ideal for the golfer who wants to practice and also for the thousands of golfers who always intend to practice."

The Craig Golf Machine Company of 590 Howard Street, San Francisco, are manufacturing these machines, which are being installed as part of the equipment in many golf schools, golf clubs, gymnasiums, business men's clubs, resorts, hotels, hospitals, on shipboard, on the roofs of downtown buildings, and in many private homes. The cost of the machine is nominal, and as the

balls are never lost, practice on these machines is much less expensive than on a golf course. It is perfectly reversible and can be used with equal facility by either right or left hand players, for short or long shots with any style club.

On a clean, smooth hit the travel of the ball on the Craig machine shows up with no vibrations and absolutely even flight. When the ball is improperly hit, you not only get the unmistakable

"feel" on the impact of the club, but this is confirmed unmistakably by the unevenness of the revolutions, the dipping from side to side, and the generally unsatisfactory flight of the ball in its revolutions around the central post. It is impossible for the machine to operate smoothly or properly unless the ball is properly hit so that you have a constantly visible register of your progress toward perfection in the "canny art" of golf.

Trade Literature

Catalog No. 28 of the Dake Engine Company, Grand Haven, Michigan.

Seventy pages handsomely bound in heavy buff art paper with black stampings describing the air and steam motors, pneumatic hoists, contractors' hoists, crane hoists, hoisting engines, swinging engines, motor crabs, electric hoists, steam steering gears, spud hoists, gangplank hoists, capstans, windlasses, fish net lifters, and other apparatus for contractors' use built by the Dake Engine Company. This is the twenty-eighth edition of the Dake catalog and in it are introduced a number of important changes for the improvement of Dake engines.

The Dake engine is a double reciprocating engine which imparts a rotary motion to the shaft through a

very simple and exceedingly compact arrangement of hollow cam and pin type. They can be used advantageously either with steam or compressed air, are very handily reversed, readily accessible for repairs, and occupy so little room as to be almost a negligible part of the entire space occupied by the apparatus which they are driving. The steam consumption compares favorably with that of an ordinary slide valve engine. There are no eccentrics and no bolts or nuts inside the piston chamber. The Dake engines have demonstrated their reliability and efficiency for over twenty-five years. The catalog describes their application to various forms of hoist and other handling apparatus especially designed for their use.



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Where you want it
As much as you want*

PREST-O-LITE Dissolved Acetylene and Prest-O-Lite Service have made the oxy-acetylene process indispensable in ship-yards.

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FW-513-21

At a sale held in Seattle July 12, the full-rigged Chillicothe was sold to Captain John F. Blain and associates for \$25,500 to satisfy liens of about \$22,000. The Shipping Board's claim, said to be about \$140,000, the amount for which the vessel was sold to the Fox interests, cannot be satisfied.

Announcement has been made in Seattle that the East Asiatic Company would increase its Pacific Coast-Europe sailings from one to two and perhaps three vessels a month during the canned goods season. Bremen has been made a port of call of these vessels.

The recent improvements at the port of Nagoya have made it possible to accommodate larger ships than formerly, vessels as large as 7000 tons now entering, say Commerce Reports. Some foreign liners of the Nippon Yusen Kaisha, on the Shanghai-New York line, the Yokohama-Bombay line, and the Yokohama-Calcutta line are now calling at Nagoya. The port has been suffering from post-war conditions and will greatly benefit by a revival of trade. Most of the cargo shipped from Yokkaichi originates in Nagoya, whose shippers will gain much if they can hereafter enjoy direct exportation facilities.

Officials of the Los Angeles Harbor Commission and of the Salt Lake Railroad have signed an agreement whereby the city pledges itself in return for concessions by the railroad to put in new wharves and tracks on the east side of the harbor. Authorization of the sale of \$2,100,000 in bonds remaining of

FOREIGN TRADE OF UNITED STATES FOR FISCAL YEAR.

The statement of the foreign trade of the United States by months during the fiscal year ended June 30, 1921, just issued by the Department of Commerce, shows a decrease in the value of imports and exports of merchandise, as compared with those during the year ended June 30, 1920. Imports were valued at \$3,666,769,537 and exports at \$6,519,365,734 during 1920-21, as compared with \$5,238,352,114 and \$8,108,988,663 during 1919-20. The trade by months and years follows:

	1916-17	1917-18	1918-19	1919-20	1920-21
IMPORTS.					
July.....	\$182,722,938	\$235,926,332	\$241,877,758	\$343,746,070	\$337,113,971
August.....	199,316,480	267,451,767	273,002,934	307,380,978	313,111,498
September.....	161,018,511	236,196,808	241,696,644	333,448,747	363,200,391
October.....	158,638,720	227,427,465	246,781,906	401,845,120	333,166,724
November.....	178,967,719	235,515,554	251,068,035	321,810,272	321,269,075
December.....	201,411,184	277,841,467	310,481,517	395,710,723	360,501,431
January.....	241,731,282	333,912,001	312,997,644	474,823,869	398,796,869
February.....	198,479,966	297,715,549	274,125,754	461,869,669	344,869,669
March.....	226,257,159	312,162,017	267,590,590	328,903,206	254,960,241
April.....	251,015,966	278,281,337	272,156,949	495,738,571	251,570,435
May.....	283,727,164	322,828,084	326,879,281	510,001,864	381,901,186
June.....	303,612,439	299,136,611	292,915,513	552,605,524	198,000,000
Total.....	2,619,555,145	2,915,635,808	3,042,750,068	5,218,352,114	3,666,769,537
EXPORTS.					
July.....	\$44,713,964	\$72,774,414	\$67,867,769	\$64,637,415	\$74,130,478
August.....	540,167,458	486,605,597	527,011,936	616,034,425	578,187,091
September.....	514,924,111	514,594,904	550,305,991	593,711,266	601,606,229
October.....	492,843,916	512,191,146	541,859,410	611,318,419	721,201,370
November.....	516,167,324	487,377,091	522,276,503	740,013,985	676,528,311
December.....	525,233,740	604,112,468	555,086,112	681,163,999	739,289,774
January.....	613,254,962	591,787,059	622,008,726	772,003,790	651,771,433
February.....	467,944,096	411,761,979	385,007,012	615,165,745	485,281,597
March.....	551,955,089	522,907,218	607,141,646	819,556,017	385,800,216
April.....	839,975,815	509,412,503	714,813,117	684,318,392	384,381,106
May.....	549,671,545	558,921,594	569,605,025	715,521,241	329,738,279
June.....	574,465,759	441,769,399	429,379,283	625,175,127	240,000,000
Total.....	6,200,048,591	5,919,711,371	7,232,252,643	5,198,988,963	6,519,365,734

the 1919 issue is expected to follow. The city now will be enabled to widen the main channel from 500 to 1000 feet. Signing the agreement, negotiations over which had dragged for two years, was facilitated by a visit to Los Angeles by officials of the Union Pacific, headed by President Carl Gray.

According to a cablegram from Consul General C. B. Hurst, Havana, under date of July 2, 1921, the Cuban prohibition against the importation of rice has been removed by

a presidential decree. No increase was made in the retail price at which rice may be sold. The prohibition against the importation of rice has been in effect since September 7, 1920.

Deaths

James Prentice Sneddon, general superintendent of the Babcock & Wilcox Company, June 11.

Captain Alfred Stetson, superintendent of the Griffiths & Sprague Stevedoring Company, in Seattle on June 13.

Captain John W. Russell, former port warden of Seattle, June 29.

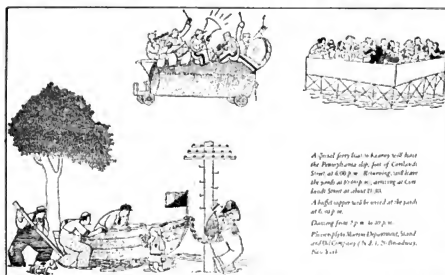
Hugo Holtz, purser of the Oceanic liner Ventura, in San Francisco on June 25.

Captain A. L. Pedersen, president of the Bristol Bay Packing Company, in Seattle July 7.

Frank J. O'Connor, general agent of the Pacific Steamship Company, Portland, Oregon, in Portland July 5.

A. E. Mail, cashier of the General Steamship Corporation, in San Francisco July 15.

Captain H. M. Guphill, master of old-time American sailing vessels and a veteran of the Civil War, in Orting, Washington, July 15 at the age of 86. He was the father of Captain J. E. Guphill of the Admiral liner Wenatchee.



A Special ferry boat is being built for the Pennsylvania dept. of the Standard Oil Company at 600 p.m. Working on the yard at 600 p.m. carrying on the beach street at about 10:30.

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This very clever cartoon illustrated the invitations sent out by the Marine Department of the Standard Oil Company of New Jersey for the launching of the tanker J. A. McDevitt, Jr., at the yard of the Federal Shipbuilding Company, Kearney, New Jersey, Thursday, July 14, 1921.

PACIFIC MACHINERY

EXPANSION IN A PORTLAND FOUNDRY

IN these days of industrial pessimism it is a pleasure now and again to meet with optimistic manufacturers who have the courage of their convictions. The American Marine Iron Works of Portland, Oregon, prior to the war manufacturing jobbers in foundry and machine shop work, at the outbreak of hostilities considerably expanded their plant and entered heartily into the business of making ship castings. During the emergency ship-building period they turned out practically all of the castings for the wooden vessels built by the Standifer Construction Corporation and for the steel vessels built by the same firm. They are now completing the castings for the five 12,000-ton steel tankers which the Standifer yard is building for private account. In connection with this particular order the American Marine Iron Works turned out some very notable propeller castings, as described in an article in a former issue of Pacific Marine Review. These propellers cast in one piece weighed over 11 tons and were 18 feet 3 inches in diameter.

Prior to the war the American Marine Iron Works had patented and developed a valveless pump. Work on this machine had stopped during the war, but early in the present year the company decided to actively push the business of manufacturing these pumps on a large scale. This necessitated additions to the plant and alterations. Seventy-five feet were added to the foundry. As shown in the illustration, this is of the same construction as the main building. The total length of the foundry is now over 200 feet.

The main bay is 50 feet wide, and the runway for the large crane spanning this bay is extended out of the end of the building for 70 feet into the yard so that large flasks can be taken directly by the crane from their place in the storage yard to the molding floor.

A new fireproof concrete three-story warehouse, 100 feet by 160 feet, is being built to take care of



Six-inch valveless pump on test at the dock of the American Marine Iron Works, Portland. This pump driven by a 25 H. P. motor at 200 R. P. M. is delivering 1200 gallons per minute against a total head of 56 feet.

Columbia Commercial Studio

the storage of finished machines, spare parts and stock. This is connected to the dock by a new siding which is so located that cars can be unloaded or loaded by means of the large foundry crane.

The two side bays of the foundry are each 25 feet wide by 200 feet long. On one side half the length of the bay is used for castings up to 1000 pounds, the other half being occupied by the core-makers, core ovens and drying ovens for molds. The large oven in this section of the

foundry is of the car type, the cars being built very rigidly of steel and having a capacity of 50 tons each.

In the bay on the other side of the foundry one end is occupied by the cupolas, of which there are two, one 40 inches and the other 72 inches inside the lining. The latter is said to be one of the largest cupolas on the Pacific Coast. These cupolas are served by a 15-ton traveling electric crane and by three pneumatic cranes of 2-ton capacity each. In the other end of this side bay small light castings are made up to 50 pounds.

This part of the shop was especially fitted to manufacture castings for drag saw engines, and the company is particularly proud of the work that they have turned out in making the cylinder for the small engines driving these saws. These cylinders are made of semi-steel to stand 100 pounds pressure with a wall thickness of only 3/16 of an inch, and the greatest care is necessary in preparing the semi-steel mixture and in the molding work in order to make a sound casting under such conditions. The American Marine Iron Works have had great success with these particular castings. On one run of 565 cylinders cast and machined, not a single defective casting was found.

In this section of the foundry the American Marine Iron Works are also manufacturing Johnson's safety floor drains, which are also very light in section although of quite large size. This bay is fitted with one Herman plain jar molding machine and two Mumford combination jar squeeze molding machines. The main bay of the foundry is equipped with a large Herman plain jar molding machine, and it has been found that these machines in many cases have increased the output by over 100 per cent.

The firm is patentee, sales agent and manufacturer of Beers Victory pipe bending machine. This machine, which has on several occasions been described in the columns of Pacific Marine Review, has achieved



General view of the American Marine Iron Works showing additions to foundry and foundations for new warehouse
Columbia Commercial Studio

ed quite a reputation for itself in the cold bending of pipe. Sizes up to 6 inches can be easily bent cold without filling, and great speed and economy are realized, particularly in the making of standard multiple bends.

The dock at the American Marine Iron Works is of the double deck type, 400 feet long and 100 feet deep, with direct connections to sidings from transcontinental railways. There is 30 feet of water at this dock at low tide, so that large vessels can discharge cargoes here without difficulty.



Snow type condenser built by the American Marine Iron Works



the second wildcat. At three o'clock in the morning the first wildcat, still in the flask in which it was cast, was shipped to Standifer's yard. At 6:30 Monday morning the second wildcat was cast, and at eight o'clock in its flask was on the way to Standifer's yard.

These castings weighed over 4000 pounds each. The second casting was delivered within seventeen hours from the time the patterns had been received in the foundry. Both cats were cast from the same cupola. The castings, which turned out to be clean, strong, sound metal, were machined and on board the tanker by Wednesday morning, delaying the ship's sailing date by only one day.

View in the foundry of the American Marine Iron Works showing one of the cupolas and a large gear casting 13 feet 6 inches in diameter used in Beers pipe bending machine

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SOME OBSERVATIONS ON CALIFORNIA INDUSTRIES

By FRANK R. DEVLIN

Former President California State Railroad Commission

IN my opinion, the one thing upon which the material prosperity of California depends more than any other, is the economical, timely and intelligent development of the hydro-electric resources of the state.

California more than any other state in the Union, and perhaps, indeed, more than any other section of the world, has been blessed in natural resources. First the lure of the mines arrested the attention of the world and beckoned the hardy pioneers to the new Eldorado of the West. Then came the transition from mining to agriculture, followed by the marvelous development of the deciduous and citrus fruit industry. Now the state's magnificent harbors and the rivers tapping its fertile valleys presage a wonderful shipping future, and it takes no great vision to foresee its opportunities, facing as it does the certain and comparatively early development of the Orient.

It has always been recognized that the only serious handicap to California as a manufacturing state is the lack of cheap fuel. Nature in disposing of her wonderful bounties was most generous to our state, but California never possessed coal either in character or amount that would be of any appreciable value in manufacturing industries.

With the discovery and development of the California oil fields some years ago, it was hoped that this important link, so necessary to the strength of California's chain of development, was supplied. But the uncertainty of oil production, and the ready absorption of the California supply abroad as well as at home, reduced very measurably the hope that California was ready to take her position in the front rank in the manufacturing world as she had in practically every other line of commercial development. Today experts are endeavoring to estimate how long the California oil supply

will last, and feverish effort is being made to discover other oil deposits throughout the state. At the same time engineers and economists are endeavoring to determine how long the supply in the coal fields will satisfy the demands of the nation; survey is being made of the vast coal fields of Pennsylvania, West Virginia, and other coal producing sections.

California has, however, in another form and in an amount that is little short of stupendous, potential fuel and power that will, in my opinion, if intelligently developed, make California the leader as a manufacturing state as it was in mining and as it is in fruit raising.

The tremendous waste of power in this state which has been flowing down the mountain gorges and to the valley streams and thence to the sea in the form of unharnessed and unchecked hydro-electric power is something almost appalling. Science has demonstrated that these millions upon millions of horsepower can be brought from the mountain gorges to the valleys to aid irrigation; to the seaboard to aid manufacture; to the railroads to facilitate transportation; and to the homes to make even more comfortable the residents of California.

With the readjustment period through which we have been passing, will come, in my opinion, an abnormal period of development. Industry and manufacturing will be promoted on a larger scale than ever before. But the one thing that the promoters of large manufacturing industries will first demand before locating a plant will be sufficient and permanent fuel or power. Plants investing millions and tens of millions will look further than a fuel supply for five years, or ten years, or twenty years; but they will make inquiry as to what the fuel or power supply will be fifty years hence.

Unquestionably the most permanent, if not indeed the only perma-

nent, supply of power that nature guarantees will be that of hydro-electric.

The Pacific Coast possesses approximately two-thirds of the potential hydro-electric power of the United States. Is there any question as to the future of California as a manufacturing state with this power available and waiting only the development and conversion from waste water into electric energy? The answer should be No; but the answer should be qualified, and I again repeat what I said at the outset—namely, the one thing upon which the material prosperity of California depends more than any other is the economical, timely and intelligent development of her hydro-electric energy.

Timeliness means now. That is, it means an immediate recognition of our potential hydro-electric power possibilities and an anticipation of the demands which, if we are to enjoy the benefits of those resources, soon will be upon us.

Economical development means a comprehensive, business-like, scientific development with due regard to proper co-ordination of the various hydro-electric developments throughout the state.

Intelligent development means a recognition by the public that the development of the hydro-electric resources brings an added value, and added income and added prosperity to every resident of California whether immediately engaged in the electric development work; whether cultivating the fields or the orchards; whether engaged in merchandising in the larger cities or towns of our state; or whether indeed employed as an artisan in any of the various industries of the state.

Intelligent development can be had only through a recognition by our people of the fact that fair and honest treatment must be accorded those who undertake such work.

HEAT LOSSES FROM BOILER SCALE AND SOOT

By F. A. PAGE

Boiler Inspector

THE hard coating of insoluble matter precipitated by boiler feed waters on the water heating surfaces of steam boilers is called scale. Should this deposit be an insoluble powder anywhere inside of the water or steam space, it is called sediment.

Both scale and sediment are poor conductors of heat, both cause over-

heating of boiler shells, and wherever there is a deposit of sediment or scale, we are most likely to find evidence of corrosion.

One of the principal objections to boiler scale of ordinary thickness is, that it may cause the metal over the fire to be so highly heated as to cause burning. The leakage of joints and tube ends, so caused, results in

corrosion and other forms of rapid deterioration.

So far as evaporative efficiency is concerned, soot on fire surfaces is often as effectual a heat retarder as is ordinary scale. Soot is known to be a very good non-conductor of heat, in fact so much so that, according to authorities, the heat resistance of soot is approximately

forty times that of boiler steel, or, in other words, a coating of soot one-tenth of an inch thick would offer as much resistance to the transmission of heat as a boiler plate four inches thick.

Water is a poor conductor of heat, and the heat is in most cases applied to the bottom of the shell or tubes. The resulting circulation is generally conceded to travel in vertical lines or planes, the heated water passing upward, its place being taken by slightly cooler water in its turn. Therefore, to secure the best results in evaporative efficiency, the contact or medium of heat transmission between the furnace fire and the water must be in the cleanest and most perfect condition possible, and maintained in that condition. The steel shells or tubes are the mediums, and good mediums, when clean. The instant this outer or inner

surface—we are dealing principally with the inner surface—becomes coated or insulated in any way, there is an immediate reduction in the evaporative efficiency of the boiler, which depends upon the amount, solidity and general character of the coating or scale. A very thin scale frequently produces an easily detected loss of efficiency. In conjunction with the loss of efficiency, the presence of scale in a boiler seriously increases its wear and tear. Do not turn cold water into a boiler which is already hot in order to crack the scale to loosen it, so that it can be easily removed, for such a course is disastrous to a boiler and the boilermaker will be required to do much work before your boiler will be fit for service.

From experiments by J. A. Carney (see Proceedings of the American Institute of Mining Engineers,

1897), on the effect of scale on the transmission of heat, it was shown that a calcium sulphate scale of 0.11 of an inch thick caused a loss in evaporative efficiency of over 7 per cent. Other experiments made since, have shown a loss of nearly 10 per cent in evaporative efficiency with a coating of scale only 3/64 or 0.047 of an inch thick.

The evaporative loss of efficiency is largely due to the solidity and general character of scale. Some scales offer as high as one hundred times the resistance to the transmission of heat that boiler steel offers. It is a self-evident fact that it is of the utmost importance that boiler shells and tubes be kept as free from scale as possible, in the interest of safety and also to promote evaporative efficiency and prolong the life of a boiler. (From California Safety News.)

PROPELLING MACHINERY U.S.S. TENNESSEE

(Continued from page 486)

Auxiliary Turbine-Generators

In each engine room there are three 300-Kw. direct-current turbine-generators, which supply current for light, for operating the various motor-driven auxiliary machines throughout the ship, and for exciting the generator fields.

Pumps

The main and auxiliary condensate and circulating pumps, as well as the oil-cooler circulating pumps, are motor driven. The vacuum is normally maintained by air ejectors, but as this is the first use of air ejectors for main condensers on a battleship, steam-driven air pumps are also installed.

The Propeller Motors

The four propeller motors are of the Westinghouse induction type, and each is rated at 8375 horsepower at its maximum speed.

In order to provide two speed ranges, each motor can be connected so as to provide either 24 or 36 poles. The primary, or stator, has two independent windings, one for each pole arrangement: while the secondary, or rotor, has a single winding, with cross connections, which forms a polar winding terminating in three slip-rings with the 24-pole arrangement, and a squirrel-cage winding with the 36-pole arrangement.

The motors are operated at their lowest speed by connecting them for 36 poles and supplying them with power from the main generators operated at their lowest speed, so that for a ship speed of 10 knots the motor speed is 78 r. p. m. and the generator speed is 1430 r. p. m. To in-

crease this speed, the speed of the generators is increased, and at the maximum generator speed the motor speed is 118 r. p. m. and the ship speed 15 knots. To still further increase the ship speed the motors are connected for their 24-pole winding, and by again varying the generator speed a range of motor speeds of from 118 to 180 r. p. m. is obtained, and the speed of the ship is increased from 15 knots to maximum. One turbine generator gives sufficient power up to about 17 knots, while above that speed both are required. This arrangement gives a wide speed range, and at the same time makes it possible to obtain efficient operation of the turbines for both low cruising speeds and full speeds.

The motors are ventilated by means of duplicate motor-driven exhaust blowers mounted on top of each motor. Each blower has a capacity of 12,500 cubic feet of air a minute, and draws air through the cores and windings, and discharges it into ducts to the deck. These blowers are assisted by fan vanes on the rotors of the main motors, which can supply sufficient air to permit the motors to be operated at full load for short periods, even if the exhaust blowers fail.

A small direct-current motor is geared through a clutch to each propeller shaft and is used to turn the motor, rotor and the propeller slowly for inspection or repair.

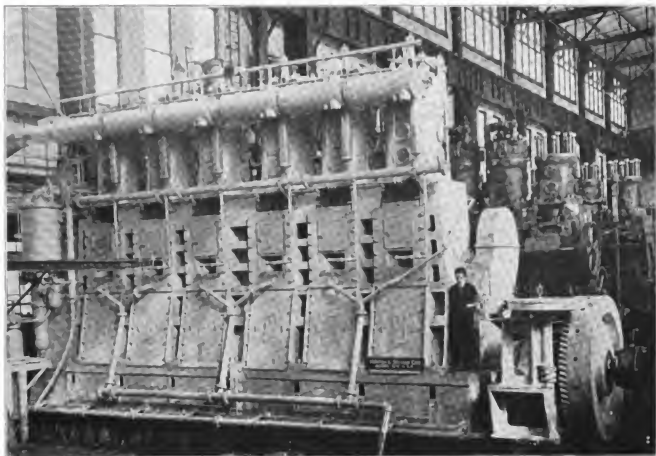
The Control Room

All of the apparatus necessary for controlling the propelling machinery

is located in the control room. The switches are mechanically operated by means of levers, which are arranged in a row down the center of the room. All of these levers are mechanically interlocked so that it is impossible to close or open wrong switches. Facing these levers, in plain sight of the operator, is a set of meters giving full information as to the operation of the machinery and the condition of the various circuits.

All of the switches handling the main high-voltage current are of the oil-break type and are capable of being opened safely under full load and voltage, although normally they will not be so opened. The majority of the switches are located in a structure in front of the control board, where they are fully safeguarded with covers but are easily accessible. A special device has been built, by means of which the oil tanks of the switches can be easily lowered so as to expose the contacts. A system of electrical interlocks and disconnecting devices protects the men against possibility of faulty operation, and also makes it possible to render safe for inspection the circuits of any one or two motors while the others are in operation.

All of the main turbines, generators, motors and control equipment, the auxiliary turbo-generators, air ejectors, circulating and condenser pumps, and the motors for operating the steering gear and the deck winches, were manufactured by the Westinghouse Electric & Manufacturing Company.



The above picture shows one of our 1200 I. H. P. Directly Reversible Marine Engines on the test floor. A pair of these engines have been installed on the M/S "KENNECOTT."

Other sizes available for Marine work, 390, 640, 1550, 2000 and 3000 I. H. P.
all four cycle and directly reversible.

DIESEL TYPE MARINE ENGINES HEAVY DUTY

McINTOSH & SEYMOUR CORPORATION
AUBURN, NEW YORK

149 BROADWAY
NEW YORK

412 BISBEE BLDG.
JACKSONVILLE, FLA.

815 SHELDON BLDG.
SAN FRANCISCO, CAL.

PLEASE MENTION PACIFIC MARINE REVIEW WHEN YOU WRITE

(Continued from page 490)

period, handling 16 to 18 charges during that time. A spraying device is arranged in each filter with a nozzle for each leaf. This spraying device moves slowly across the leaves releasing small streams of water in a rotary movement at 45 pounds pressure. All of the water used in sluicing the filters is in turn filtered through mud presses, and the sweet water recovered is used over again in sluicing the Sweetland filters.

Char Filters

The next step in refining sugar liquor is the removal of the coloring matter through contact with animal charcoal. From the Sweetland presses the liquor goes to receiving tanks and is separated into various grades according to purity. From these tanks it runs by gravity to the charcoal filters below. The filters are cylindrical cast iron tanks 26 feet high by 10 feet in diameter, having a capacity of 52 tons of animal charcoal. The purity of the first liquor leaving the char filter is 99.2 to 99.5. This liquor is used for the manufacture of high grade specialties.

The average rate of flow through the char filters is 1250 to 1350 gallons per hour per filter under pressure of 15 to 18 pounds, the liquor being kept in contact with the charcoal for approximately $6\frac{1}{2}$ hours. The filters are usually operated on raw liquor for 16 hours and handle during that time about 20,000 gallons.

The poorer grades of raw liquor are then put through the same filter and either sent on to be made into granulated sugar or returned to be refiltered, according to quality.

After the bone charcoal has become clogged up, the liquor remaining in the filter is allowed to settle and then forced out by hot water from the top. The hot water is run through the charcoal and the liquor taken off to a point where it reaches a density of 30 brix. After that it is run into the sweet water system through the evaporator storage tanks to be concentrated and again put through the refining process. The hot water is continued through the charcoal and taken off as sweet water until it has been reduced to a point where the sucrose content is 21/100 of 1 per cent. After that the wash water goes to waste. On a 2000-ton capacity run approximately 900,000 gallons of water per day is required for the washing of the char filters alone.

Handling charcoal for these filters is one of the large items of expense in sugar refining. The washed charcoal is first dried and then burned in charcoal kilns at temperatures up to 850 degrees Fahrenheit. In the Crockett refinery this process of revivifying the charcoal takes place about twice a week, and the charcoal has an average life in the refinery of about five years. The charcoal used is burned animal bones ground and grated to a specified fineness.

Liquor Gallery

From the charcoal filters the sugar liquor flows through the liquor gallery. Here it is run through a series of weirs and troughs, and the operator can view and test every product and divert it according to its color and purity, to its proper station.

From the liquor gallery the liquor is pumped into storage tanks near the vacuum pans and drawn into these pans to be boiled under vacuum at a temperature of 170 degrees Fahrenheit. As the water is boiled off, the sugar crystallizes, is dropped into mixers below, and from the mixers into centrifugal machines where the moisture is spun off in the same way that the raw sugar was washed in the centrifugals at the beginning.

Leaving these machines the white granulated sugar contains approximately 2 per cent moisture. It is carried by conveyors and elevators up to large cylindrical drums where by the revolution of the drum it is sifted as hot dry air is blown over and through it. This dry granulated sugar then passes to magnetic and size screens, the various sizes being led off from these screens into storage bins. The bins are fitted with spouts and automatic weighing machines for feeding the sugar into sacks and various small containers.

Bar sugar and powdered sugar are made from granulated sugar ground in special mills constructed for the purpose. Bar sugar has a very fine grain and powdered sugar no grain whatever. Confectioner's sugar has to be specially boiled, and cube sugar is made from granulated to which syrup is added as a binder.

"Lumps Is Lumps"

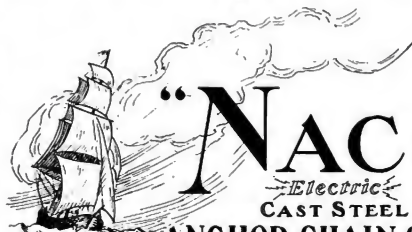
Rather an interesting factor developed in the sugar business in connection with the use of cube sugar during the war. Cube sugar is made in cubes and cubelets, a cubelet being about two-thirds of a cube. The use of cubelets in restaurants was encouraged as a possible means of saving sugar, and now it is found that there is very little demand for cubes, the restaurant people finding that there is a great saving of sugar when cubelets are placed on the tables instead of cubes. We suppose this is due to the psychological idea that a lump is a lump and most people are trained to have one, two or three or four lumps to the cup of coffee or tea, and their beverage seems just as sweet with two cubelets as with the two cubes.

Power Plant

All of the machinery in the Crockett refinery, including the belt conveyors, is operated by electric motors, some 3000 K. W. hours being required for this purpose. This power was formerly purchased from the Pacific Gas and Electric Company, but at the same time it was necessary to heat over a million gallons of water daily for refinery use and to evaporate approximately 640,000 gallons from sugar solutions, all of this heating being done by steam. This presented a very interesting opportunity for steam engineers, and it was solved by C. C. Moore & Company through the installation of a modern boiler plant and turbo-electric generators, this installation having been erected during the last three years.

This plant consists of ten 600 H. P. Babcock & Wilcox boilers arranged with entirely automatic control for oil burning. Peabody type furnaces are used with Leahy rear shot oil burners. Each boiler is insulated with 4 inches of asbestos covered with a steel casing. These boilers supply steam at 150 pounds throttle pressure to three non-condensing Curtis type turbines direct connected to 1500 K. W. 480-volt 60-cycle 3-phase General Electric generators. The pressure of the exhaust steam is 10 pounds, and this steam is used for heating purposes all through the refinery.

Last year the fuel used per ton of sugar melted was 13 per cent less than the average for the previous five years, and at the same time the power used in the refinery was produced as a by-product. At the present time when all of the exhaust steam is used, the power generated will cost about one-tenth of a cent per K. W. hour. Its present operating system does not at all times use all of the exhaust steam; the present cost of power is one-quarter of a cent per K. W. hour average. In order to permit all of the exhaust steam to be used and so reduce operating expenses the corporation is now installing two 14-foot Calandria vacuum pans.



"NACO"

Electric
CAST STEEL
ANCHOR CHAIN CABLE

marks the only advance in chain making in keeping with shipbuilding progress that has brought us the great steel ships of today.

It is the only cable that affords the measure of protection adequate to safeguard these mammoth liners of the deep.

Its tested strength is 40 per cent greater than that of any other type of Anchor Chain Cable.

That is why it meets the emergency and holds up under greater strains and more severe shocks than any other type of cable.

This is why Naco Chain affords the greatest protection to lives, cargoes and ships.



THE NATIONAL MALLEABLE CASTINGS CO.
CLEVELAND, OHIO

MINIMIZING THE DANGER OF FIRE AT SEA

THE great danger of fire on board steamships, especially those using oil for fuel, is of course in the boiler room, where the fires are kept constantly going, to generate the steam necessary to keep the ship on her course.

A Firefoam System has been designed by the Foamite Firefoam Company to protect steamships against this danger. This system has been approved by the United States Steamboat Inspection Service and it is the only system with this approval.

In addition to the Firefoam System for protection of boiler room, the Foamite Firefoam Company will furnish the "F D W" fire alarm system.

This system consists of a fire detecting wire installed throughout all parts of the ship, connected to an indicator located on the bridge or in the captain's or chief engineer's quarters. It is always on duty, and will give an alarm of fire in any part of the ship within a few moments after the fire starts. This fire detecting wire system, combined with Firefoam extinguishing equipment, provides safety, heretofore impossible, against fires at sea.

With all the advance in safety appliances on land and sea, there has been a steady increase in the number of fires in steamships, with a corresponding increase in loss by damage to ships and in destruction of cargoes.

Oil As Fuel

The adoption of oil as a fuel for steamships is responsible for a large percentage of the increase in the number of marine fires. During the last twelve months the loss resulting from such fires has been particularly heavy.

It is practically impossible to avoid a dripping of oil in front of the boilers. This oil in the vicinity of the fuel oil pump is always in danger of being ignited.

A break in the oil line or in any of the units necessary to convey the fuel from the tank to the burners is another grave menace. A break in the pipe line may flood the stokehold. A fire breaking out under such conditions will spread instantly throughout the entire hold.

Many perils menace the men who go down to the sea in ships, but of them all none holds more terrors than that of fire.

The ordinary landsman usually considers himself safe from danger of fire if he has at hand a sufficient water supply and means of bringing that supply in contact with the fire, and hence to his mind the danger of fire in a ship surrounded by an ocean of water seems very remote.

The difficulty of the situation is immediately apparent, however, when we consider the fact that if the fire in a ship gained much headway it would be necessary to pump into the ship, in order to put out the fire, sufficient water to sink the ship.

Keeping this phase of the matter in mind, we are not surprised when statistics show that 75 per cent of the fires at sea result in total loss of the ship.

Any system, therefore, which without the use of water will make ships, and particularly ships carrying oil fuel in bulk and those burning oil fuel in their furnaces, safe, is a very welcome addition to the equipment of our merchant marine and a very profitable investment for our ship owners.

Abundant proof has already been given in actual performance at sea that the installation of Foamite Firefoam Systems on shipboard provides adequate protection for safety against all fire danger and meets that danger with a promptness and efficiency which is little short of miraculous.

Oil drippings from the engine room and boiler hold may find their way into the bilge, forming a great fire menace aboard ship.

Oil, which is regarded as the greatest of fire hazards on land, is even more dangerous in the hold of a ship. Water has little effect on blazing oil, because the oil will float on water, and, continuing to burn, spread the fire.

Any attempt to extinguish burning oil confined in the tank or hold of the ship, by the use of water, can have but one result—the water sinks to the bottom, and the flaming oil rises as the quantity of water pumped into the tank increases, and the flaming liquid may overflow or communicate the flames through the hatches to the deck above. The more water that is applied to burning oil, the greater may be the danger.

A survey of losses resulting from marine fires demonstrates the necessity of meeting this contingency. Firefoam does meet it, overcomes it, conquers it.

Firefoam eliminates this danger, because it is lighter than the lightest oil. It floats and flows freely over the

burning surface, covering it completely, smothering the flames, and making it difficult to reignite any surface covered by it.

Firefoam is a fire-smothering, fire-extinguishing foam which covers all burning objects as with a blanket. It puts out a fire quicker than any other extinguishing agent and prevents reignition, excluding the oxygen and stifling the flames!

It coats and clings to all surfaces. It floats on the most inflammable liquids. It is effective against fire of any origin or nature!

It stays where it is put, not only while the fire is burning, but long after there is any possibility of its blazing up again.

Firefoam is applicable to every form of fire-risk, and can be applied through Firefoam automatic sprinklers, through stand-pipes and hose lines, and by means of portable apparatus—Firefoam

fire pails, extinguishers, and engines.

There is no risk, however small or large, where Firefoam cannot be supplied to meet the demands of even the most exacting situation.

Firefoam Efficiency

All carbon dioxide gas generated in the apparatus of a Firefoam System is retained in the Firefoam and deposited directly on the burning surface in the form of a blanket of bubbles.

These bubbles resist high temperatures; they are strong enough to last for hours after the fire is extinguished, and leave no damage in their wake.

As the Firefoam can be applied to the danger points in a ship within a few moments after the fire is discovered, and since fires even in oil tanks with a capacity of 55,000 barrels have been put out within a few moments after the Firefoam was turned onto the oil, there is no chance whatever for the oil to become heated and overflow.

Firefoam Does No Damage

Firefoam will not damage anything in a steamship—here again demonstrating its superiority over the use of water. The majority of cargoes are ruined by the application of salt water; the very machinery upon which the ship depends for its power to navigate may be ruined by the application of large quantities of sea water.

Firefoam will not damage the ship's cargo or injure passengers or crew.

Clothing drenched with Firefoam shows no effect of its application after a thorough cleansing.

Aquitania Protected by Firefoam

A Firefoam System was installed on the great Cunard liner Aquitania when she was converted recently into an oil burner. The Aquitania may certainly be called a fire-proof ship. She is protected from stem to stern, from boiler room to bridge, with Firefoam.

S. L. KREIDER SHIPPING

Gen'l Agent
TOYO KISEN KAISHA
WILLIAMS S. S. CO., INC.

At Los Angeles
375 Pacific Electric Building
At San Diego
239 Spreckels Building

Service for Ship Machinery



A typical Westinghouse marine service

IN order to reduce to a minimum the delays in port for ships using its machinery, the Westinghouse Electric and Manufacturing Company has established marine service stations at New York, Baltimore, Newport News, Savannah, New Orleans, and San Francisco, where stocks of repair parts are kept and a corps of experienced marine engineers, repairmen, and riggers is in readiness. Each station is also supplied with sets of blueprints showing the details of all Westinghouse marine machinery, and each receives complete records and reports on all ships equipped with this machinery.

Each morning the port engineer in charge of the station receives reports of the arrivals in the ports within his territory and details inspectors to visit each Westinghouse-equipped ship. This inspector, with the aid of the chief engineer and the engine-room crew,

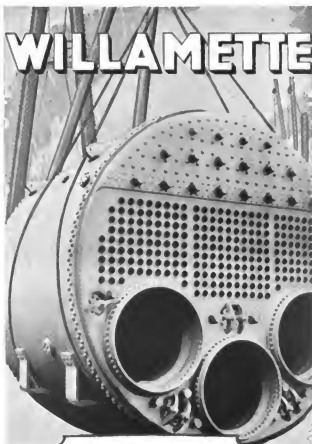
makes a thorough survey of the equipment and submits a written report to the port engineer with copies to headquarters at South Philadelphia, to the other service stations, and to the owners of the steamship. This report serves as a basis for repairs on the ship. The necessary repair parts are immediately secured from the local store room and where possible are sent down to the pier by auto truck.

When desired, the Westinghouse organization takes entire charge of the installation of the new parts under the supervision of an engineer, who also conducts dock trials and sea trials when the work is completed.

The service department also supplies guarantee engineers to accompany new ships on their first trips to instruct the crews in the operation of the machinery and to keep performance records.



The Baltimore Westinghouse marine service department going aboard ship



REINFORCED by wide experience covering many important marine operations, the Willamette plant is well prepared to undertake and complete your work with satisfaction, economy and dispatch.

**MARINE MACHINERY
MARINE AND
STATIONARY BOILERS
DECK MACHINERY
AND AUXILIARIES
MARINE REPAIRS
OF ANY CHARACTER**

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IRON & STEEL WORKS
Portland, Oregon, U. S. A.

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San Francisco, Cal.
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Seattle, Wash.
Canadian Office
916 Rogers Bldg.,
Vancouver, B. C.



SUTTER 44-19

Mr. Shipowner—Mr. Merchant

Your business is world wide—so is our service.

Shanghai, Sydney, Nagasaki, Africa, no matter where your vessel or goods go, we take care of your insurance problems—and losses.

Would you like to have your own "Insurance Department" without adding a penny to your payroll?

It can be arranged, call Sutter 44-19.



FRANK B. HALL & COMPANY
INCORPORATED

AVERAGE ADJUSTERS & INSURANCE BROKERS
56 BEAVER ST., NEW YORK

**SAN FRANCISCO OFFICE -
322 CALIFORNIA STREET**

FRANK K. HITCHING

244 California Street

Phone Douglas 4705-6

AGENT FOR

YAMASHITA KISEN KAISHA**Australasian Direct Service***REGULAR MONTHLY SERVICE*

100 A1 Steamers

— TO —

Auckland, Sydney, Melbourne

(other ports if inducements offer)

Seattle—Vane, B C—San Francisco

YOSHIDA MARU No. 1.....Aug. 7.....Aug. 9.....Aug. 15

YOSHIDA MARU No. 2.....Sept. 7.....Sept. 9.....Sept. 15

(Via Los Angeles if inducements offer)

Manufacturers and Agents Attention

ON page 62 of the advertisement section of Pacific Marine Review for July there appeared an article under the caption, "Operators, Attention!" in which there was described an argument which had been started between the United States Shipping Board and certain manufacturers of paint and other marine supplies over the specifications issued by the Shipping Board for paint to be used on its ships. Along with this article there appeared a table showing prices paid by steamship companies and contract prices paid by the Shipping Board for various lines of engine room supplies, in which it was made to appear that the Shipping Board was paying for these supplies an amount greatly in excess of that paid by steamship companies.

The subject matter of this table has been called in question, and it appears from representations made by various manufacturers that the figures are comparatively misleading and in some cases actually in error.

A very slight difference from ordinary standard commercial practice in the specifications of cylinder oil or steam packings might more than account for the differences in price per gallon or pound shown in this table. There might be all kinds of evidence to show that the standard commercial practice was better packing than the "special" specified, but if special specifications have to be lived up to in a contract the contractee must pay the bill.

We are reliably informed that the special grade of high pressure steam packing used by the Shipping Board is bought for \$1.50 per pound, not \$1.60 as stated, and it is very possible that there are

other similar mistakes in the prices named. All such figures must be considered also from the standpoint of the present trend of price reduction, and it is noteworthy that the articles chosen for comparison have no connection with paints, although the article itself emanates from a paint manufacturer and the theme is centered entirely around the alleged abuses in Shipping Board paint practice.

NEW PACKING CATALOG

A CATALOG presenting its full line of packings, gaskets and pump valves is one of the important recent publications of the United States Rubber Company. Fully illustrated, it departs from the usual form of such catalogs and is filled with very definite information regarding each item listed and the specific uses for which it is best fitted.

To assist in the selection of "the right packing for the right place," a classified index of the various styles of packings sets forth the various packings which are recommended for the various conditions of service. The drawings show the details of construction with such clearness that the adaptability of any style of packing may easily be judged.

As the oldest and largest rubber company in the world the United States Rubber Company has a wealth of experience to bring to the aid of its customers and the engineering department of the company is at the service of manufacturers with special problems. The catalog goes into many of these problems, pointing out the special adaptability of each style.

PRATT & WHITNEY STAYBOLT TAPS

TO MEET all your boiler requirements, we build P & W Staybolt Taps in five standard styles, as well as Spindle Staybolt Taps with and without threaded end and also Combined Reamer and Tap to tap continuous hole in the reamer hole of the far boiler plate.

Our reputation for precision and high quality stands behind these tools. Buy them in any of the styles and sizes listed in our Small Tool catalogue which is yours for the asking.

These taps and our complete line of Small Tools are on sale at our offices in Boston, Philadelphia, Birmingham, Rochester, Cleveland, Detroit, St. Louis, Cincinnati, Seattle, St. Paul, New Orleans, San Francisco.

PRATT & WHITNEY CO.

111 BROADWAY

NEW YORK

Works Hartford, Conn.

310

ON HEAVY tapping like this, P & W Staybolt Taps show their quality. They bite into the work with a precision and ease that makes them favorites with the men who use them.





You're looking through Oxygen to read this!

BUT the gas your eye pierces—the gas you inhale at every breath—is but the *raw material* for Linde Oxygen.

Every trace of physical contamination must be eliminated, every chemical impurity removed before atmospheric oxygen is pure enough to meet Linde requirements.

To that end a great army of Linde scientists are constantly at work rigidly maintaining the high standard of Linde purity. To their efforts is due the absolute uniformity for which Linde Oxygen is famous.

A chain of seventy-five plants and warehouses insures prompt deliveries of any volume, anywhere.

THE LINDE AIR PRODUCTS COMPANY

Carbide and Carbon Building, 30 East 42nd Street, New York

Balfour Building, San Francisco

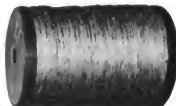
THE LARGEST PRODUCER OF OXYGEN IN THE WORLD

L-581-21

HOW MANILA ROPE IS MADE AND USED

ON a recent trip to Portland a representative of Pacific Marine Review had the privilege of inspecting the rope works of the Portland Cordage Company, a modern factory splendidly equipped for the manufacture of manila ropes and hawsers. Through observation and questions he there gleaned the following interesting rope facts, which are here passed on for the benefit of our readers.

Rope is one of the oldest implements used by man. It



was probably first made of skins of animals, later from vines and finally from different varieties of fiber. The process of manufacture has been practically unchanged for centuries, although there has been great improvement in late years in the machines used for carrying out the process.

Though many countries have produced fiber suitable for rope making, the Abaca fiber, commonly known as manila hemp, produced in the Philippine Islands, gives the most serviceable rope for present-day uses.

This fiber comes into our ports in bales weighing about 270 pounds. These bales are opened at the factory and the fiber is combed out, cleaned and fed by hand into a machine called a breaker, where it is oiled, re-combed, the hanks broken up, and emerges as a continuous ribbon or sliver of fiber. This process is repeated until the sliver emerges from the finishers drawn to about the size of a man's finger.

It is now ready for spinning, generally with a right-hand twist, in yarns of various sizes. These yarns



Rope making in the time of the Pharaohs

are the basis for all ropes. They must be true to size and free from dirt, tow and fiber bark. The yarn is wound on bobbins holding about ten pounds.

The next step is the formation of rope strands. The strand is made from a number of yarns, the number depending upon the size of rope desired. These yarns

prevent rotting, ropes should never be put away wet and dirty, nor should they be left on the floor to dry, but should be cleaned and put on a rack or grating to allow free circulation of air. Use the largest sheaves possible with a running rope so as to minimize internal friction.

In using the rope on a capstan or dolly, see to it



are formed into the strand with a left-hand twist and the strands are then laid together into a rope, three or more being used, with a right-hand twist, this reversal of twist preventing the untwisting of the rope. If the proper care has been used in the process and the fiber has been well cleaned, we will now have a first-class manila rope or hawser.

Considerable care must be taken of this rope both in its storage and its use, or it will quickly be ruined. The storeroom should be dry and well ventilated. A damp room will cause dry rot, a hot dry room will make the rope brittle, in which case it will wear quickly on the pulleys. Care should be taken that no acid of any kind comes in contact with any rope. A very slight amount of acid on the boards of the floor will be absorbed by a coil of rope and several courses of the coil will be damaged. In using rope be sure to have blocks of ample size to allow for the swelling of the rope when wet.

Dirt in a working rope will very quickly ruin the rope. For this reason, and to

that the rope is thrown on at different times in alternate directions. If thrown on in the same direction continuously the rope will gradually lose its twist. Always

allow an ample factor of safety, avoid sharp bends while under strain and in general use common-sense in rope treatment.

The Portland Cordage Company, Portland, Oregon, has achieved a splendid reputation for the dependability of their manila ropes and hawsers. This is evident from the following table showing the results of tests carried out by the Federal government on ropes supplied to the Panama Canal Commission during 1920. It will be noted that in every instance the strength of the manila ropes was well ahead of the specifications, the percentage of excess strength varying from 9½ to almost 30 per cent. In a series of tests covering such a large quantity of rope and such a wide range of sizes, this is quite remarkable.

Tests of rope sold to the Panama Canal Commission in 1920 by the Portland Cordage Company:



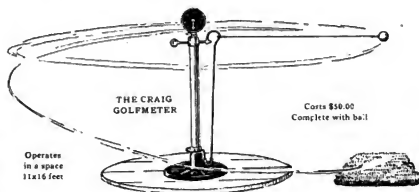
1200 foot coils	Size ins.	Wgt. lbs.	Average wgt. per coil lbs.	Est. govt. wgt. lbs.	Our break lbs.	Re-quired break lbs.	Over per cent
257	$\frac{3}{4}$ "	6,129	23.8	24	843	700	20.4
485	$\frac{3}{4}$ "	22,780	47.4	50	1,656	1,450	14.2
330	$1\frac{1}{2}$ "	28,407	86.1	90	2,857	2,450	16.6
280	$1\frac{1}{2}$ "	42,335	151.2	160	4,833	4,000	20.8
400	$\frac{3}{4}$ "	78,246	195.6	198	5,484	4,900	19.3
246	$1\frac{1}{2}$ "	66,406	270	270	8,478	7,000	21.0
505	1"	159,734	316.3	324	10,603	8,200	29.3
330	$1\frac{1}{4}$ "	164,042	494.0	504	15,770	12,500	25.6
161	$1\frac{1}{2}$ "	113,705	706.0	720	20,807	17,500	18.2
37	$1\frac{3}{4}$ "	38,148	1031.0	1080	30,080	25,500	18.0
190	2"	239,627	1261.2	1296	34,932	30,000	16.4
75	$2\frac{1}{2}$ "	148,227	1976.4	2016	50,880	43,500	16.9
5	3"	13,871	2774	2916	66,800	61,000	9.5
3	$3\frac{1}{2}$ "	11,525	3841.7		101,900	82,000	24.2

3304 1,133,182
The above deliveries were on Panama Canal Commission's contracts as follows:

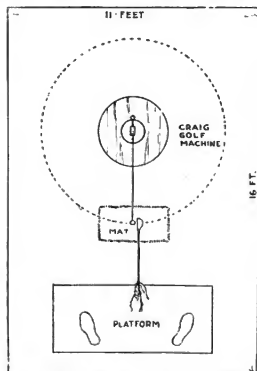
Circular 1261	Washington order	No. 89451
Circular 1275	Washington order	No. 90818
Circular 1285	Washington order	No. 91953
Circular 1312	Washington order	No. 94774
Circular 1359	Washington order	No. 98856
Circular 1365	Washington order	No. 99080
Circular 1396	Washington order	No. 101461
Circular 1408	Washington order	No. 102712

When golfers travel they miss their golf—Unless the ship carries a Craig Golfmeter

You can make your ship a golfers' paradise at little cost with this wonderful machine—takes up little space. Everybody enjoys it.



Golf nowadays is so tremendously popular that a large and important percentage of every passenger list practically demands some form of deck golf on ocean going voyages.



The Pacific Mail Steamship Line after a twenty-day voyage of the S. S. Empire State with a Golfmeter on board are now equipping all of their larger boats with Golfmeters. The Taiyo Maru of the Toyo Kisen Kaisha Line is en route to the Orient at present writing with a Golfmeter on board. The Matson Line is equipping the S. S. Hawkeye and the Buckeye State with Golfmeters.

The Pacific Steamship Company is equipping its three big boats with Golfmeters as fast as they come into port and are putting one on the President to try out its feasibility on shorter trips.

These big steamship companies have found the machine to be of intense interest to their passengers, not only adding pleasure to the trip from a games and competitive standpoint, but almost an essential on shipboard for the opportunities it affords to golfers traveling, all of whom wish to keep their golf up to standard through daily practice.

If your local dealer cannot supply you, write us direct.

Craig Golfmeter Co.

590 Howard Street

San Francisco

10,500-Ton Tank Steamers Refitted with De Laval Double-Reduction Gears and Turbines

AN installation of propelling units of more than usual interest has been made recently by the Atlantic Refining Company in the first of five of their 10,500-ton tankers christened W. M. Burton, Herbert L. Pratt, J. E. O'Neill, W. M. Irish and H. C. Folger. These tankers were built in 1917 and 1918 and the main dimensions are as follows: Length, 435 feet; beam, 56 feet; mean draft, 27 feet; depth of hold, 33.6 feet.

A change in propelling equipment was considered advisable, and an order was placed with the De Laval Steam Turbine Company to build five compound double-gear units for these vessels. The rating of the original geared turbine propelling units was 2600 horsepower, and in making the change the Atlantic Refining Company decided to increase the horsepower rating of the units somewhat in order to obtain higher speed from the tankers.

Turbines

The new propelling units rated at 3300 horsepower each, and designed to give the tankers a speed of 11 knots, consist of cross-compound turbines of the De Laval impulse type divided into high pressure and low pres-

sure sections and connected to the single screw through a set of double reduction one plane speed reduction gears. Each turbine delivers its full power at a speed of 3200 r. p. m. The reduction of speed from that of the turbine to that of 90 r. p. m. on the propeller is accomplished in two steps, making a total reduction ratio of 35.5 to 1.

These turbine elements are so arranged that they can be operated independently of each other in case of emergency by means of a very flexible throttle control. The high pressure turbine element for ahead operation is equipped with one velocity stage and seven pressure stages. The low pressure element for ahead operation consists of six pressure stages. A reversing element located in the high pressure turbine operates in series with a reversing element located in the low pressure turbine.

Full power is developed at a steam pressure of 200 pounds, with 50 degrees F. superheat and a vacuum of 28 inches. Each turbine section develops one-half of the full rated power for running ahead. The astern elements develop two-thirds of the full ahead torque.

Governor

Steam is admitted through

a strainer to a valve under control of speed governors located on the forward end of both high and low pressure turbines. These governors are set to bring the governor valve into operation when the speed reaches 10 per cent above normal. When brought into operation this governor does not entirely cut off steam as an emergency trip would do, but holds the speed below a safe limit without shutting down the unit.

From the governor valve steam passes into the ahead or astern nozzle of the high pressure section, thence through the stages of that section, thence to either the ahead or astern nozzle chambers of the low pressure section, and through that section into the condenser.

The maneuvering valves are of the balanced vertical spindle type, and control the steam to the ahead and astern elements of the turbine. These valves are operated by hand wheels and are interlocked so that only one can be operated at a time. Hand valves are installed for further controlling the steam supply to the first stage nozzle of the high pressure section.

Leakage of steam through the throttle valve to the astern element is prevented by a guarding valve which is

controlled from the main operating platform.

The piping between the two turbine sections is so constructed that the operating engineers can easily make steam supply connections to operate either section separately in case of emergency.

The turbine case is supported in such manner that it is free to expand in all directions without changing the position of the axis, so that the center line of the wheel case and the center line of the shaft coincide under all conditions. It is, therefore, possible to start the turbine quickly and safely, without danger of rubbings, vibration or other troubles due to distortion by heat. Ample bucket clearances both axially and radially are provided so that the danger from internal rubbing is reduced to a minimum.

Reduction Gears

The speed reduction gears are mounted directly abaft the turbines. The high speed reduction consists of two parts in two separate casings, one of which is bolted to the low pressure and the other to the high pressure sections of the turbines. De Laval pin couplings which provide for free axial motion connect the turbines to the



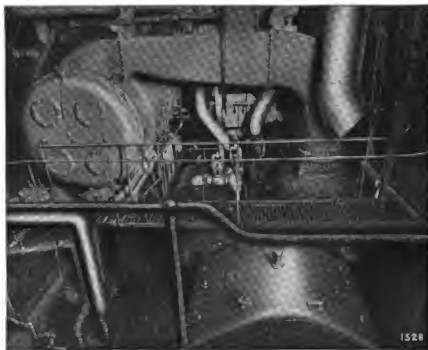
10,500 ton tanker W. M. Burton, length 435 feet, beam 56 feet, mean draft 27 feet, depth of hold 33.6 feet

high speed pinions. The low speed gear with pinions is contained in one casing. The high speed and low speed gear cases are entirely independent of each other, the high speed gears being connected to the low speed pinions by means of a De Laval rubber bushed flexible coupling which gives proper compensation for any slight inequalities of alignment.

Both high speed and low speed gears are of the standard rigid De Laval type designed for low tooth pressure and ample factors of safety. The pinions are made from nickel steel forgings and the gears consist of cast iron centers upon which are shrunk seamless rolled steel bands in which the gear teeth are cut.

The general details of gear construction are in accordance with standard De Laval practice and similar to the general details of the 2,000-000 horsepower of marine gears that have been produced by the De Laval Steam Turbine Company and which without exception have been highly successful in operation.

In order to obtain quiet operation, De Laval gears are carefully cut on gear-cutting machines specially designed by the De Laval company. The involute shape of tooth is used which gives a true line contact of each tooth so long as the tooth is in mesh. After cutting, the teeth are carefully polished by a special process to remove scratches and inequalities left by the cutting tool.



Condenser, Gear Case and Turbine from upper grating engine room S. S. W. M. Burton

This polishing must be done by mechanical means and not by hand scraping or filing. All parts entering into the construction of the propelling units are manufactured to limit gages and are interchangeable. This feature will appeal particularly to marine engineers.

Successful Operation

The operation of these propelling units was uniformly successful on the trial trip of the W. M. Burton and a speed of 11.77 knots was obtained.

Since the trial trip the W.

M. Burton has been in continuous service and the propelling equipment has operated to the entire satisfaction of the owners. The reduction gears are quiet in operation and all parts of the unit operate without heating or vibration.

The J. E. O'Neill has also been placed in service and the propelling units for the Herbert L. Pratt, W. M. Irish and H. C. Folger are now being installed and the vessels will be placed in service immediately.

On account of the anticipated

low steam consumption the original condensing equipment which was installed in connection with the original 2600 horsepower propelling units was not changed as the total steam consumption of the new units rated at 3300 horsepower was not greatly in excess of the total steam consumption of the original 2600 horsepower units. On the trial trip the condenser was found amply large to take care of all the steam used by the new unit and very satisfactory vacuum was obtained.

TRADE LITERATURE

Seven Centuries of Brass Making. Bridgeport Brass Company, Bridgeport, Connecticut, 1920.

This handsomely bound book of 75 pages gives a brief history of the ancient art of brass making and its early method of production as contrasted with the present electric furnace process. Some very interesting old prints are reproduced, running back to the beginning of the fifteenth century, while the text carries the reader back to the ancient Egyptian copper and brass workers of 4700 B. C.

After this historical introduction the booklet goes on to an analysis of the problems of brass making and to the history of the efforts

made by the Bridgeport Brass Company in the solution of these problems, leading up to their present electric furnace equipment and machinery for drawing brass in all kinds of special shapes and sections.

The Signode System of Nail-less Box Strapping. Signode System, Inc., manufacturers, 564 West Adams street, Chicago.

A 12-page pamphlet describing the method of fastening box straps with a sealed joint and without the use of nails. The system includes a patented process, patented joints, and patented tools for the application of the joint. The tools include a stretcher and a sealer. The

steel strap is stretched onto the box under high tension and sealed under tension so that all strains or blows upon the box are transferred to and absorbed by the steel joint and do not cause loosening of the box nails. This system is also adaptable for the binding of all sorts of bales, fibre containers and loose articles, such as automobile tires, stove parts, bundles of catalogs, etc. It is claimed that this system has acted as a deterrent of pilferage.

Small Tool Catalog No. 46.

The GTD Corporation, Greenfield, Massachusetts. From the frontispiece depicting the plants of this largest manufacturer of small

tools in the world, to the seventy or more pages of tables and useful information at the back of the book, this catalog contains a great deal that is of interest to the user and designer of tools and machinery. Some of the tables are new and especially instructive.

The tools described include screw plates, taps, dies, drills, reamers, milling cutters, bits, arbors, countersinks, hobs, tap and drill bits, mandrels, sleeves, sockets, stocks, tap wrenches, pipe vises and pipe wrenches.

A copy of this book will be sent to any address provided the name of this publication is mentioned.

A UNIQUE BRIDGE MODEL

THE small photograph attached shows a picture of the Tower Bridge in London, England. The large photograph shows the same bridge made of Crane valves and fittings.

This novelty was built at the Bridgeport, Connecticut, works of Crane Company and the only guide used throughout the entire work was the postal card view of the original bridge. This bridge is now on display at the Crane exhibit rooms, 23 West Forty-fourth Street, New York, and later will be shipped to Crane-Bennett, Ltd., London, England.

Fifteen thousand three hundred and fifty-eight pieces taken from regular stock, comprising 230 different kinds of elbows, tees, crosses, nipples, valves, etc., were used in building the bridge. Sixteen thousand two hundred and fifty-one joints were required to make up the fittings, and it is worthy of note that not one left-hand thread was used in the entire structure.

The bridge is approximately 19 feet long by 11 feet high by 4 feet wide. The spans are 67 inches wide. It is of the roller lift type, having four towers, each tower being provided with one elevator. The lifts are 22 inches long by 30 inches wide.

The elevators are 6 inches square by 8 inches high; the upper part of the elevator cage being made by using a brass floor flange with a plug screwed in, into which the cable used for raising and lowering the elevator is fastened. The men operating the elevator are represented by reducers, nipples and caps.

The towers are neat in construction and well proportioned, having four spires—one on each corner. These spires are neatly constructed by the use of malleable iron reducers, caps and cast iron flange unions.

The cables connecting the towers to the approaches are made up of nipples, tees and 45-degree elbows.

Each approach is provided with two clocks bearing the name of Crane-Bennett, Ltd.

The lifts and elevators are raised and lowered by specially devised machinery. The reversing is done by an unusual mechanical movement and no clutches are used in



its construction.

The bridge is illuminated by thirty-six lights, eight being red and green for controlling traffic, four of which are used for navigation and four for traffic on bridge. When the bridge is closed the red light flashes and the green light extinguishes to show that the bridge is closed to navigation. At the same time, the green lights open traffic on the bridge. When the bridge is open the green light flashes to navigation and the red light to traffic on the bridge. Eight hundred feet of wire was used to carry out the electrical effect.

In the sidewalks there are 1600 right-hand close nipples together with numerous galvanized tees, crosses and elbows. This has offered a great amount of speculation as to how the elbows, tees and crosses were made up with standard right-hand close nipples, each fitting being not more than 1/16 inch apart, and is worthy of consideration.

The curb separating the sidewalk from the roadbed is represented by galvanized nipples slotted and slipped over a tongue which holds an amber glass roadbed.

The bridge is mounted on skids covered with granite packing, painted a wavy green. When looking through the amber glass roadbed onto the green granite packing it gives a very good effect of the witching waves.

The shades on the arc lamps are made of galvanized malleable iron reducing nipples.

Those who have had an

opportunity to inspect the bridge speak highly of it, and it is indeed an accomplishment of which Crane Company may well be proud.

Oil Bunkering Facilities

THE Union Oil Company of California has been largely extending the facilities it offers to shipowners for the bunkering of vessels with either fuel oil or diesel at both domestic and foreign ports of call. Through the courtesy of the company we are enabled to present to our readers the following list of ports at which Union Oil Company's products are available for marine bunkering. These facilities are being constantly extended to other ports:

Union Oil Company Bunkering Ports for Fuel Oil—Vancouver, B. C.; Seattle, Wash.; Portland, Ore.; Astoria, Ore.; Oleum, Calif.; San Francisco, Calif.; Port San Luis, Calif.; San Pedro, Calif.; Wilmington, Calif.; San Diego, Calif.; Honolulu, T. H.; Balboa, C. Z.; Iquique, Chile, S. A.; Antofagasta, Chile, S. A.; Talital, Chile, S. A.; Mejillones, S. A.; Topocilla, Chile, S. A.; and Valparaiso, Chile, S. A.

Union Oil Company Bunkering Ports for Diesel—Vancouver, B. C.; Seattle, Wash.; Portland, Ore.; Oleum, Cal.; San Francisco, Calif.; San Pedro, Calif.; Wilmington, Calif.; Honolulu, T. H.; Bal-

boa, C. Z.; Antofagasta, Chile, S. A.; Valparaiso, Chile, S. A.

Pamphlet TX, Pawling & Harnischfeger Company, Milwaukee, Wisconsin.

This pamphlet describes and illustrates a new attachment known as the skimmer boom, which is designed as an additional boom for the standard P. & H. 205 or 206 excavator cranes. By replacing the standard boom with this new attachment the crane becomes an efficient road-grading machine. The pamphlet includes data and operating cost figures on a road grading job done by a contractor with this apparatus. These figures show a remarkable saving over ordinary scoops and plows.

The boom can be installed readily in a few hours on the field and is interchangeable with the shovel attachment brought out earlier this year, or with the standard boom on either style of crane. making this crane almost instantly available for road grading, tearing up of old roadbed, shovel excavating back filling, pile driving, or all-around material handling with grab bucket, drag line bucket, scraper, electro-magnet, sling chains, or grapples.



"Straightening out like a Fiddle String"

THE experience of Captain Jamison as told in his letter of April 11th has been the common finding whenever Naco Chain has been put to an emergency test.

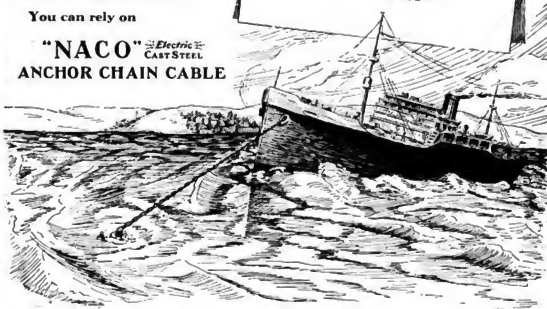
It has always been found dependable.

And to use Captain Jamison's own words—"it is a great relief to a Master of a ship to have a dependable chain—one that he can place his confidence in." To know that when the crisis comes, and life depends upon the tenacity of a single link, stud, or shackle, that his anchor chain will hold.

Naco chain is built to inspire that confidence—it is built to meet the emergency. Its tested strength, 40% greater than that of any other type of stud link cable, gives assurance of a reserve strength adequate to resist the excessive strains imposed in times of peril.

You can rely on

"NACO" ^{Electric} CAST STEEL
ANCHOR CHAIN CABLE



THE NATIONAL MALLEABLE CASTINGS CO.
CLEVELAND, OHIO

[illegible]

PLEASE MENTION PACIFIC MARINE REVIEW WHEN YOU WRITE

A NEW TYPE OF BELT-DRIVEN AIR COMPRESSORS

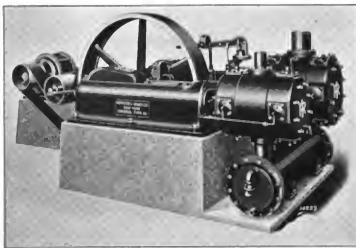
THE Ingersoll-Rand Company, 11 Broadway, New York, has announced a new line of belt-driven air compressors. This type is known as the Imperial Type XCB and has incorporated in it several noteworthy features of construction, including Ingersoll-Rand plate valves, for both the air intake and discharge, and the five-step clearance control for regulating the compressor's output.

The clearance control has been used with great success on the larger direct-connected electric motor-driven compressors manufactured by the same company and has proven itself to be the most satisfactory and efficient form of compressor regulation. Thousands of these direct-connected air compressors are installed in all parts of the world and are well known by those in charge of plants where conditions call for more than 600 cubic feet of free air a minute and where direct connected electric motor-drive is used. The use of this form of regulation is a most noteworthy development in air compressor design during recent years and should be of interest to all users of air power.

The clearance control is a method of securing extremely efficient operation at partial loads. Under average working conditions it is a well known fact that the demand for air is seldom steady throughout the working day and for this reason the performance of the compressor at underload is of primary importance.

With the clearance control the compressor is automatically loaded or unloaded in five successive steps, these steps being obtained by the reduction or addition of clearance space to the air cylinders. The compressor will operate at full, three-quarters, one-half, one-quarter and no loads and the design of the clearance control is such as to secure efficient operation at any one step, the reduction in input power required being practically in proportion to the reduction in output capacity.

An extremely valuable feature of the clearance control is the fact that the clearance pockets are made integral parts of the compressor cylinder and the entire



The Imperial type XCB Ingersoll-Rand air compressor. 15 inch by 9 1/4 inch cylinders by 12 inch stroke. Shown with short belt drive and electric motor

regulation is obtained by the control of the volume of air taken in and compressed.

With this method of control there is no loss of power due to wastage of air and leakage. The clearance pockets in the cylinder are automatically thrown in communication with the ends of each cylinder in proper succession, the process being controlled by a predetermined variation in receiver pressure. With the compressor operating at partial capacity a portion of the air is compressed into an added clearance space instead of passing through the discharge

valves. On the return stroke this air expands, giving up its stored energy to the pistons.

The inlet valves remain closed until the cylinder pressure equals the intake pressure. At this point the inlet valves are opened automatically and free air is taken into the cylinder for the remainder of the return stroke. Thus the inlet capacity is reduced without reducing the intake pressure. On a two-stage compressor clearance space in proper proportion is added simultaneously for both high and low cylinders, giving a com-

stant ratio of compression and maintaining conditions necessary for the highest compression efficiency throughout the entire load range.

Another added feature of this control is the maximum demand stop which will prevent the compressor being operated at any higher maximum load than is desired. This can be adjusted so that the compressor will operate on a maximum of one-fourth, one-half, three-fourths, or full load, and under conditions where the load factor is comparatively low, it is of value in reducing the maximum demand, permitting a saving in the purchase of electric power—a feature found in no other type of control.

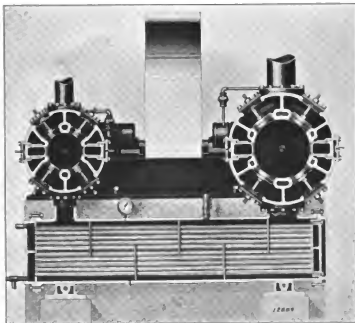
With the clearance control reduction in power required will be in proportion to reduction in output capacity. All the mechanism for regulating the compressor is independent of the compressor running gear. The loading and unloading of the compressor is automatically accomplished in steps, the difference between any two steps being small enough to prevent any undue electric current fluctuation.

It will be seen that all of these features are of extreme importance, the combination producing conditions requisite for the most efficient operation at full and partial loads.

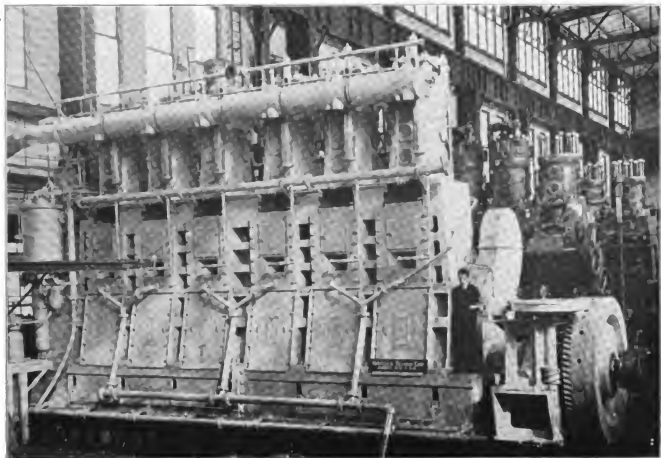
This new type of belt driven compressor equipped with clearance control can be furnished single-stage for low pressures and two-stage for higher discharge pressure. The piston displacement capacity for 100 pounds discharge pressure ranges from 610 to 1505 cubic feet of free air per minute.

Imperial Type XCB compressors can also be furnished with the well-known short belt drive attachment with floating idler. This method of drive is now well known to all users of compressors who acknowledge its advantages in saving floor space, saving in length of belt, and permitting a greater arc of belt contact.

The Ingersoll-Rand Company also announce their new Bulletin No. 3042, in which this new type is described in detail.



Section through cylinders and intercooler of Imperial type XCB Ingersoll-Rand air compressor



The above picture shows one of our 1200 I. H. P. Directly Reversible Marine Engines on the test floor. A pair of these engines have been installed on the M/S "KENNECOTT."

Other sizes available for Marine work, 390, 640, 1550, 2000 and 3000 I. H. P.
all four cycle and directly reversible.

DIESEL TYPE MARINE ENGINES HEAVY DUTY

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NEW YORK

412 BISBEE BLDG.
JACKSONVILLE, FLA.

815 SHELDON BLDG.
SAN FRANCISCO, CAL.

PLEASE MENTION PACIFIC MARINE REVIEW WHEN YOU WRITE

AN EFFICIENT COALING ARRANGEMENT

BY using a Barber-Greene portable belt conveyor, the Tampa Coal Company have achieved mechanical coaling of ships at their dock in Tampa at low first cost of machinery, especially as compared with other mechanical means of coaling ships now common; low upkeep cost, and very fair speed.

With this conveyor steamers are coaled at the rate of 400 tons a day. Usually the coal is taken from the storage pile on the dock in wheelbarrows having a capacity of 500 pounds each. The wheelbarrows are counted and the amount of coal taken on can be checked with the ship's weighing.

Sometimes railroad cars of coal come in on the track at the same time a ship docks to be coaled. Then the process is simplified. A second conveyor takes the coal from the car, discharges onto the inclined conveyor, and the coal is put aboard at the minimum expense in time and labor. Each carload also furnishes as accurate a check of the weight as do the wheelbarrow loads.



Barber-Greene portable belt conveyor coaling ship at a Tampa dock

The storage pile is built up, of course, by the conveyors. When cars are on the switch and there are no ships to be coaled, the conveyors take the coal from the cars and pile it on the dock to the height required.

This company also sells coal to users in the city which it hauls by means of motor trucks. The conveyors are often used in loading trucks directly from the car.

Ships can be coaled by ma-

chinery much faster than by hand method, and practically all labor charges eliminated. Then, too, no hand method has yet been employed by which the coal was not spread all over the ship. Coal dust is penetrating and entails an endless amount of drudgery before the ship can be gotten clean after coaling. Mechanical loading has everything in its favor as far as the sailor is concerned. But from the standpoint of the dock owner, the me-

chanical loading is a somewhat different proposition. The bunkering systems heretofore known have been expensive both as to the first cost and upkeep. They need to work constantly in order that the overhead will not destroy all the profits. It is much cheaper for the dock owner to rent barges and use the booms and other equipment on the ship for getting the coal aboard unless he can keep his mechanical equipment working every minute.

Coaling ships has therefore been either a matter of great drudgery by hand labor or a speedy process with high-priced machines. The Tampa Coal Company get coal aboard any ship at the rate of 400 tons a day, which is good speed, with a machine they can use for other purposes when it is not coaling ships. From the standpoint of any dock owner, this speedy loading, low first cost, low upkeep and general adaptability are entirely desirable.

THE McNAB SIMPLEX SALT DETECTOR

THE presence of salt in boilers is now universally admitted to be highly objectionable because of the reduced steaming capacity which results from the deposit of salt on the heating surfaces, and also because of the danger of overheating which is always present when there is scale on these surfaces. In the case of watertube boilers, now being used more extensively than in previous years, where even a small deposit of salt may have serious consequences, greater precautions are generally taken to keep the feed fresh than with the ordinary type of boiler.

The McNab simplex salt detector is designed to give a continuous indication of the amount of salt in the feed water, in grains per gallon, and will show the presence of salt there before it enters the boiler, even as small a quantity as one grain per gallon, also in the event of a sudden increase of salt—as may occur owing to a split condenser tube, or the evaporator priming—it gives

warning immediately by audible alarm, i. e., the ringing of a bell, and, visually, by the increased intensity of the electric lamp contained within the instrument, and so allows the defect to be remedied before the density of the water in the boiler increases perceptibly.

The presence of salt in the feed water of marine boilers is ordinarily due to leaking condenser tubes and evaporators priming. In the ordinary course, the water is tested by the salinometer. However the salinometer test is dependent upon the human element, being taken as and when the engineer sees fit or finds it convenient, and it gives the amount of salt in the boiler after the salt has entered.

The McNab simplex salt detector, on the other hand, automatically detects and gives warning of the presence of salt in the feed line, before its entrance into the boiler.

The apparatus is a very simple one, and its working is based on the well-known fact that pure water has a

high electrical resistance, which, however, falls very quickly if certain compounds—of which ordinary salt is one—are added to the water.

The essential part of the apparatus is a glass vessel fitted with two electrodes by which a current is passed through a sample of the feed water.

The electrodes are made of a special grade of platinum iridium, and are so arranged that no metal part of the connections is in contact with the water. This is essential to avoid the excessive corrosion which would otherwise take place. The electrodes are adjustable so that

the sensitiveness of the instrument can be varied.

The instrument gives a continuous indication of the saltiness of the feed, and this is done by having a small supply of feed water flowing continuously through the glass vessel. The resistance of water falls very rapidly for a small increase in the amount of salt present, and this tends to make the simplest arrangement too sensitive. To obviate this, in the Simplex apparatus, a resistance is introduced which is in the form of an incandescent 105 volt carbon lamp, contained within a brass dome on top of instrument.

S. L. KREIDER

SHIPPING

Gen'l Agent
TOYO KISEN KAISHA
WILLIAMS S. S. CO., INC.

At Los Angeles
375 Pacific Electric Building
At San Diego
239 Sprucela Building

The lamp shows no light when the water is fresh, but as soon as salt is present will begin to glow a dull red, which gradually increases to full brightness as the salt increases. This enables the officer on watch to see at a glance whether there is salt in the feed, and if so, whether it is in sufficient quantity to require immediate attention.

A meter gives a quantitative indication of the amount of salt present in grains per gallon at 100 degrees Fahrenheit.

Definite warning is given immediately the salt exceeds a fixed percentage, by a bell, which is operated by a relay

connected in series with the instrument. The relay is very easily adjusted so as to operate at the desired density.

The whole apparatus is self-contained in a brass case with a plate-glass door.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912.

Of Pacific Marine Review, published monthly at 576 Sacramento street, San Francisco, Calif., for October 1, 1921.
State of California,
City and County of San Francisco—ss.
Before me, a notary public, in and for the State and county aforesaid, personally appeared B. N. De Roehie, who, having been duly sworn according to law, deposes and says that he is the business manager of the Pacific Marine Review, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the afore-

said publication for the date shown in the above caption, required by the Act of Congress of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher—J. S. Hines, No. 9 Senic Way, San Francisco.

Editor—A. J. Dickie, 1036 Mariposa Ave., Berkeley.

Managing editor—None.

Business manager—B. N. De Roehie, 943 Fresno Ave., Berkeley.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.)

J. S. Hines

3. That the known bondholders, mortgages, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)

None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if

any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

B. N. DE ROEHIE.
(Signature of business manager.)

Sworn to and subscribed before me this 20th day of September, 1921.

(Seal) E. M. CLARK,
Notary public in and for the city and county of San Francisco, State of California.

My commission expires April 22, 1924.

TIME AND TIDE
WAIT FOR NO INSURANCE
TO BE PLACED
• DO IT NOW •

- DRIVEN ASHORE -
WHEN THIS HAPPENS, YOU
WILL FEEL NO WORRY
IF YOUR INSURANCE
IS IN THE HANDS OF
C.H. WILLIAMSON & CO.
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LIGHTWEIGHT MARINE GENERATOR SETS

THERE has been placed upon the market recently a Westinghouse-Sturtevant marine lighting set which is especially adapted for lighting and power on shipboard. These outfits have absolute reliability, light weight, compactness and economy of operation. Both the engine and generator making up these sets embody the results of considerable engineering and manufacturing experience. Perfect automatic lubrication, elimination of vibration, low piston speed, sparkless commutation, and excellent voltage regulation are features of the design.

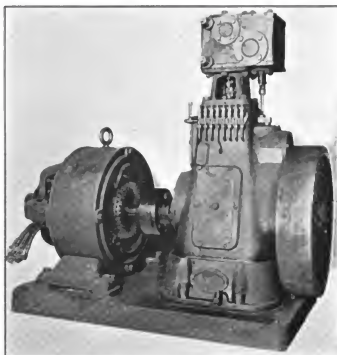
The frame is made oil and dust proof and provided with large openings having cast iron covers in such a position as to give ready access to all parts subject to wear. In the top of the frame is cast an oil reservoir for the lubricating system.

An ample distance piece separates the cylinder and frame in which are enclosed a watershed partition and stuffing box, together with the piston rod stuffing box. The watershed partition prevents the water from the cylinder leaking into the frame and the oil in the frame from being carried into the cylinder.

The cylinder is of close grained iron, of a special mixture insuring absolutely homogeneous castings, cast in one piece with the valve chest. Both are thoroughly insulated with non-heat conducting material and covered with a lagging of planished steel. The cylinder is equipped with relief valves of large diameter, which may be adjusted to open at any desired pressure. These guard against damage due to water coming over with the steam.

The valve is of the piston type and operates in a renewable bushing, which forms the valve ports. The valve is connected by means of the valve stem, slide eccentric rod and eccentric strap to the eccentric attached directly to the governor. All pins and rods are of open hearth steel and the bearing pins are hardened and ground.

The engine is equipped with an inertia governor of the well known Rites type.



Lightweight Westinghouse-Sturtevant steam driven marine type generating set

This governor is placed in a heavy fly wheel and is capable of very close regulation, keeping the variation between no load and full load as low as one and one-half per cent.

The piston is of cast iron, cored for lightness and fitted with cast iron snap packing rings, turned to perfect contact. It is pressed to a taper fit on the piston rod, and is further secured by a nut pinned to the rod. Both the connecting rod and the piston rod are of open hearth forged steel, each in a single forging. The crank pin end of the connecting rod is provided with malleable iron, marine type boxes, and the cross-head end is fitted with brass boxes of the same design.

The crank shaft is of open hearth steel made in a single forging, machined all over and carefully fitted with balancing counter weights secured to the webs, the crank pin being hardened and accurately ground to size.

The lubricating system is automatic, continuous and self-contained, requiring no independent tank or reservoir. In engines having gravity type lubrication the oil is pumped from the reservoir in the base by a chain driven rotary pump which is en-

tirely submerged in the oil, to the upper reservoir cast in the top of the frame. From here it flows by gravity through brass pipes to the various bearing surfaces requiring oil, then back to the reservoir in the base, where it is strained and pumped again. Where a forced feed system of lubrication is furnished, the submerged pump forces the oil under pressure through brass pipes direct to all parts requiring lubrication. The oil then drains back to the base, where it is strained and again forced through the system. An oil well level gauge is supplied, attached to the outside of the base.

With every engine there is regularly furnished an automatic hydrostatic type lubricator, a set of wrenches and anchor bolts with plates when required.

The Westinghouse type

"SK" generators forming part of these sets, have all the good features that have made the "SK" line of motors and generators so successful in general utility service and in numerous special applications. In addition the generator is especially constructed to meet the requirements of marine service.

The frame is forged from open hearth steel, eliminating the possibility of blowholes as in cast material and resulting in a light compact but strong construction.

The bearing on the generator is a solid steel shell, babbitt lined and so constructed that no leakage of oil will occur with listing of the ship.

The armature coils are so constructed that no cross-overs on edge occur, thus eliminating a prominent cause of armature insulation breakdown. Both armature and field windings are impregnated with a special compound for resisting the moisture and salt atmosphere found in marine service.

One of the fundamental ideas of the design is the open, well ventilated construction. The air can circulate freely through the generator, coming in through contact with all internal parts and thus eliminating the possibility of internal hot spots which in time could not fail to have a damaging effect on the insulation.

Sparkless commutation results from the application of commutating poles and consequently the wear of commutator and brushes is reduced to a minimum. This is especially so since the speed of these sets is relatively low. The brush position is fixed before the set leaves the factory and never requires any adjustment.

Non-corrosive material is used for brush holders and all parts which might be affected by moisture.



New Automatic Starter For Squirrel Cage Motors

Provides for Generous Starting Current and Protects Motors Against Burnouts

THE new 9604 automatic starter developed by the Cutler-Hammer Manufacturing Company for small squirrel cage motors allows a large starting inrush for several seconds but at the same time gives positive protection against burnout troubles. The two unique mercury overload relays mounted below the contact fingers eliminate all fuse troubles and the attendant expense, while they allow momentary overloads and overloads as high as 25 per cent for a limited period. They absolutely prevent harmful overloading of the motor.

The new C-H overload relay consists of a glass tube carrying a mercury column which forms a part of pilot circuit of the magnetic switch coil. A portion of this column is surrounded by a heating coil or thermal element. This element is in series with the motor circuit and is heated in the same proportion as the motor windings. Excessive current

gers drop away and disconnect the motor from the line. After such an interruption, the mercury cools down, becomes liquid again, drops back into the tube so that the pilot circuit to the magnet coil is complete when the control button is depressed.

As the functioning of these overload relays depends upon the temperature



The Cutler-Hammer mercury tube overload relay.
Cut by Courtesy W. M. W.

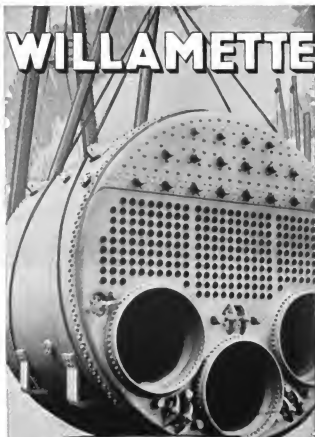
at which mercury will boil, it is evident that the current required to operate the relay increases with the decrease in the temperature of the surrounding air. In other words, if the motor and the starter are installed in a cool location, the relay permits a greater starting current or a higher overload than if the temperature of the surrounding air were higher.

The push button station which is supplied with C-H 9604 starters can be installed in any position that is most convenient for the operator. The time saved by using an automatic starter in place of a manually operated starter depends of course upon the frequency with which the motor operated machine is started and stopped, but even with comparatively few starts and stops, the time saved is surprising. The new starters are being used in connection with all kinds of machinery which is driven by squirrel cage motors of comparatively small horse power—7½ horse power and less.



Automatic starter with cover open, finger indicating position of mercury overload relay.
Cut by Courtesy W. M. W.

passing for too long a period heats the coil, causes the mercury to boil and the vapor to pass up into a chamber at the top of the tube. This action breaks the liquid mercury column and opens the circuit to the magnet coil. As this coil is de-energized, the contact fin-



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NOTABLE PNEUMERCATOR INSTALLATION

Control of Oil Fuel Tanks on S. S. Paris

THE Technical Bulletin of the Bureau Veritas for July, 1921, features a very interesting article on the pneumercator as installed on the new liner Paris of the Compagnie Generale Transatlantique. The Paris is propelled by quadruple screws driven by Parsons type turbines, steam being supplied by fifteen double end boilers burning fuel oil. She is 765 feet long and on her maiden voyage averaged better than twenty-one knots at sea, her turbines developing 32,000 horsepower. She carries 6161 tons of fuel oil, which is ample for the return voyage from Havre to New York.

The oil is stored in forty-eight compartments; all the tanks and ballast tanks are provided with steam heating pipes, allowing the use of even the thickest oils which, when heated to a temperature of 70 or 95 degrees Fahrenheit, are made sufficiently fluid to run through the feed pipes.

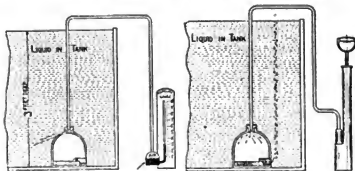
All the tanks are connected to a double feeding system, enabling either the burner pumps to be fed direct, without passing the oil through the settling tanks, or to feed these pumps with oil from the settling tanks, or to feed the oil from the lower parts of the lateral tanks or ballast tanks to the settling tanks, to have the water drained off; the latter operation is carried out by means of special transfer pumps, three in number, and can be carried out at all times on account of the double feed system.

All the various oil tanks of the S.S. Paris have been fitted with "pneumercator" gauges.

The pneumercator system is an application of the pneumatic transmission of hydrostatic pressure due to a column of liquid to a distant observing station whether the liquid column be the height of a tide, the level of a river or reservoir, the depth of liquid in a storage tank employed in some industrial process, the fuel oil in a ship's bunker or otherwise.

Essential Features

An inverted hollow hemisphere is fixed at or near the bottom of the tank. In its side a sharp edged



Diagrammatic representation of the principle of the Pneumercator tank gauge

orifice is cut which forms the datum or zero line from which measurements are made.

To this balance chamber, as it is styled, a small air pipe is connected and led away to the distant indicating gauge. This pneumercator gauge is a mercury column pressure indicator.

Near the gauge is located a hand operated air pump connected up to the system by means of the control cock which is an important feature of the system.

Principle of Operation

Imagine the tank empty and that liquid is pumped in; as soon as it covers the sharp edged orifice air is trapped in the balance chamber. As the level of liquid rises in the tank the head of liquid above the orifice impresses a corresponding pressure on the imprisoned air, which pressure is transmitted by the small air tube to the mercury indicating gauge.

The control cock allows of this pressure being applied to, or cut off from the gauge,

or again allows of the gauge being isolated and vented to atmosphere. It further allows of the air pump being connected directly to the balance chamber by way of the air piping.

Since, as the head of liquid and consequently the pressure on the imprisoned air, is increased, its volume will decrease, liquid will enter the balance chamber and thus cause a false datum of measurement by raising the liquid level in the balance chamber slightly above the orifice or datum level.

This is overcome by the provision of a simple hand air pump, which, used in conjunction with the gauge control cock, allows of air being pumped into the system so that the liquid in the balance chamber is depressed to the sharp edged orifice and thus the datum of measurement is maintained.

A few strokes of the pump are made before each reading so that all readings are made with a perfectly definite datum of measurement.

During the use of the air

pump any excess air pumped in freely bubbles out at the balance chamber orifice and does not affect the datum level.

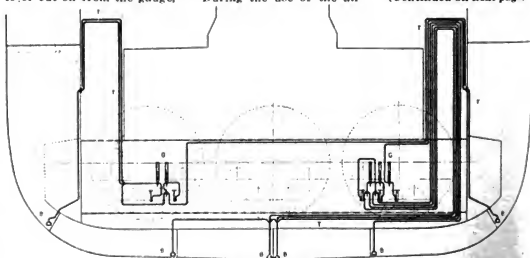
By means of the control valve the air pumped into the system is deflected past the gauge, so that no air flows through or over the indicating mercury which would tend to oxidize the mercury and render it sluggish in the gauge indicating tube, is allowed.

The control valve is now turned to connect the balance chamber to the gauge so that the pneumatic pressure in the balance chamber due to the head of liquid above its orifice (and datum level) is transmitted through the air tubing to the mercury gauge and the mercury column rises to a height equivalent to the head of liquid in the tank.

By putting the control cock to "vent" the mercury chamber as well as the upper end of the indicating gauge tube are opened to atmosphere and the mercury falls to the datum level zero on the gauge scale. Thus the gauge zero can be checked at any time.

The operation of the air pump before taking a reading insures the correct maintenance of the datum level in the balance chamber. If insufficient air had been pumped in, the fact is disclosed by repeating the operation when a higher reading on the gauge will be obtained, thus, the gauge is self-checking.

(Continued on next page)



Diagrammatic representation of the Pneumercator installation in the fuel oil tanks on the transatlantic liner Paris

NEW MOTOR TUG FOR HARBOR BOARD

THE Board of State Harbor Commissioners for the harbor of San Francisco have let the contract for the engine for their new inspection and tug boat to the Enterprise Engine Co. The boat is being designed by D. W. & R. Z. Dickie and is of the following dimensions:

is known as solid injection into a cup when the piston is at the bottom of the stroke at 10 pounds pressure or less. Compression takes place up to 480 pounds plus or minus, sufficient air being forced back through the holes into the cup to cause partial ignition therein, whereupon the unignited part of the

Sixty Degrees Fahrenheit	Fuel Oil	Diesel Oil
Baume (usually sold as 14), degrees.....	18.37	24
Specific gravity.....	.9436	.9091
Pounds per U. S. gallon.....	7.858	7.571
Ash (passes 20 mesh), per cent.....	.024	.037
Asphalt (residue steam distillation by weight), per cent.....	35.49	3.41
Sulphur, per cent.....	.65	.45
British thermal units, per pound.....	18,689	18,916
British thermal units, per gallon.....	146,858	143,213

Length over all.....	57' 0"
Length from the rabbet of the stem to the back of the sternpost at the shaft.....	48' 6"
Length from the rabbet of the stem to the inside of the guard at the stern.....	56' 0"
Length from the rabbet of the stem to the center of the rudder stock.....	52' 6"
Displacement length.....	50' 0"
Beam molded at the waterline.....	14' 0"
Beam over plank at the waterline.....	14' 4"
Beam over guards.....	16' 0"
Beam molded at the deck.....	14' 8"
Beam over plank at the deck.....	15' 0"
Crown of beam.....	2' in 15'
Draft forward at the forefoot.....	4' 6"
Draft at the sternpost.....	6' 3"
Mean draft keel.....	5' 4 1/2"
Freeboard at the lowest point of sheer.....	2' 9"
Sheer forward.....	3' 2"
Sheer aft.....	12"
Depth of hold.....	6' 2"
Depth from the top of the deck at the side to the rabbet line amidships.....	7' 10"

The harbor board desired an engine for this boat which could successfully use ordinary fuel oil as stored in their tanks from which they furnish fuel for the steam boilers of their tugs and dredges. Certain tests carried out by the writer had shown the suitability of the Enterprise Diesel engine for burning this fuel; further tests, as hereinafter described, fully justified the selection of this very efficient San Francisco built engine. In the Enterprise engine the fuel is supplied by what

fuel is forced out into the cylinder where combustion takes place. The expansion of the fuel delivers the power to the piston on the down stroke. The up stroke is the scavenging stroke and the next downward stroke draws fresh air (oxygen) into the cylinder for the next cycle, making a four-cycle engine. The fuel used is what is known commercially as fuel oil, and for starting in cold weather a lighter oil known as Diesel oil of 24 degrees Baume is used, the characteristics being as follows:

The Diesel oil is used at 60 degrees Fahrenheit and has a viscosity of 122 seconds Saybolt meter. The fuel oil has the following viscosities in seconds Saybolt at the temperatures given, it being necessary to heat this fuel in order to get it to flow through the pumps and small holes of the injection nozzles: (time for 60 cubic centimeters to pass.)
60 deg. Fahr., 1329 sec.
70 deg. Fahr., 880 sec.
80 deg. Fahr., 600 sec.
86 deg. Fahr., 488 sec.
90 deg. Fahr., 428 sec.
100 deg. Fahr., 312 sec.
110 deg. Fahr., 233 sec.
120 deg. Fahr., 179 sec.
130 deg. Fahr., 140 sec.
135 deg. Fahr., 122 sec.
140 deg. Fahr., 110 sec.

The Enterprise Diesel Engine Company is running on the fuel oil at 86 degrees Fahrenheit, the viscosity at this point being 488 seconds Saybolt, or 36.7 per cent of the viscosity of the fuel oil at 60 degrees Fahrenheit, but on the other hand four times the viscosity in seconds of the 24 degree Baume Diesel oil.

This heating is accomplished by means of a heating element placed in a coil through which the fuel oil is passed from the tank to the pumps, the heating of the oil to 86 degrees Fahrenheit

giving a viscosity suitable for handling nicely by the small fuel pumps.

A rather curious condition was found in the fuel oil market, it being discovered that the fuel oil usually sold as 14 degrees Baume tested 18.37 degrees and no oil could be found commercially which would test as low as 14.

Test Results

Horsepower rated, 100.
Horsepower by test, 109.59 to 121.2.
Good average h. p., 112.6.
Brake mean effective pressure, 74.8.
Bore of cylinder, 9 1/4 inches.
Stroke, 14 inches.
Number of cylinders, 4.
Revolutions per minute, 318.
Weight in pounds, 21,950.
Average fuel per h. p. hour, .405 pound.
Horsepower per gallon, 19.61.
Fuel used, 18.37 deg. Baume.
Pounds per gallon, 7.858.
This test showed conclusively that the Enterprise engine would run satisfactorily on the fuel oil, and specifications were written covering the installation of a 100 horsepower Diesel engine, as no gas engine had any chance to compete in cost of operation. In fact, the boat had only to operate 1 hour and 12 minutes per day for 300 days a year for the gas engine to cancel out, as the fuel cost of the gas engine was 349 per cent that of the Diesel engine.

Pneumeracator Installation

(Continued from page 56)

Changes of temperature of the air line system have no effect on the accuracy of the gauge. If, for example, the air line is heated up, the air in it expands and the excess volume bubbles out at the balance chamber orifice. If the air line is cooled and the air in it contracts, the tank liquid rises very slightly in the balance chamber, but when the air pump is operated for the next reading the air volume is restored and the datum level regained.

Since the transmitting medium is air only, the gauge may be above or below the tank or at any reasonable distance from it. On board SS. Paris there are 20 deep bunker tanks, 24 double bottom tanks, 2 expansion tanks and 2 settling tanks, making 48 in all, fitted with pneumeracator tank gauges. The deep bunker tanks and the double bottom tanks are divided into pairs, one gauge being arranged to

measure the contents of both tanks forming a pair, being connected to either tank at will by means of valves fitted near the gauge. Each of the expansion tanks is supplied with a separate gauge fitted with electrical alarm gear to give signals when these tanks are 25 per cent full and when 95 per cent full. The settling tanks are also fitted with a separate gauge, each with alarm gear to operate when

the tanks become 95 per cent full. The pneumeracator gauges are grouped at convenient observing stations in the various boiler rooms. The gauges are sealed to show the weight of oil in the tanks. Such scales are found to be specially convenient in connection with the settling tanks, as they permit of consumption tests over given periods being made by direct weight observation.

MARKEY ELECTRIC AUXILIARIES

FOURTEEN years ago, the Markey Machinery Company of Seattle started operations building deck machinery mostly for local business in the Pacific Northwest and Alaska, but during the war the demand for their products became more general and such that it was necessary to enlarge their plant and capacity to turn out deck equipment and steering machines for both steam and motor vessels and to take care of the demand for the installation of oil engines.

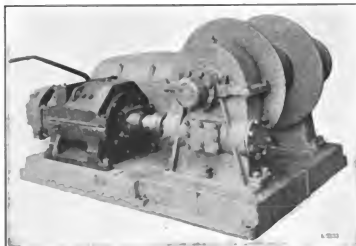
In connection with the various motorship installations a demand arose for high-grade electrical deck machinery, such as cargo winches, anchor windlasses, deck capstans and steerers, and through such demand a line of high-grade machines has been developed, of which the latest is the worm drive cargo winch which is a machine of refinement to a degree not generally found among deck machinery.

Worm Gear Winch

High grade steel is used for the worm and after cutting it is thoroughly heat-treated and hardened and the surface of the threads ground and polished to reduce friction to a minimum. The worm wheel is a phosphor bronze rim with the teeth accurately cut, mounted upon a steel spider. An efficiency as high as 95 per cent has been obtained with this combination. To obtain these results from the worm drive it is necessary that the parts be mounted in proper bearings so that little power is absorbed at these points, and with this in mind ball bearings of the highest grade were selected which are self-aligning in nature so that even comparatively great distortions in the shafts do not affect the running of the bearings.

Controller and resistance are totally enclosed within a ventilated housing on the base-plate beside the motor and the hand control is such that it is operated vertically much in the same manner as the control for a reversing valve steam winch. The winches may be set in pairs in such position that two machines can be operated by one man.

A magnetic disk brake attached to the motor and



Compact electric worm drive cargo winch as manufactured by the Markey Machinery Company of Seattle

braking on the motor shaft is so connected through the controller that the use of current by the motor releases the brake, but as soon as the current is shut off the brake is applied. Dynamic braking is used in lowering the load so it is always under perfect control and may be stopped without sudden shock.

Electric Steerer

In the electric steerer care has been taken to follow a well-tried system which has proven satisfactory. The non-follow-up method of control which eliminates numerous parts and which has proven so satisfactory in use in the United States Navy has been adopted. There are no mechanical connections between the steerer and the control stand; tele-motors are eliminated and all connections are strictly electrical.

The motor is in operation only when it is desired to move the tiller from one position to another. By means of the master control on the bridge through the panel upon which the automatic switches are mounted, the motor is in control of the steersman and the rudder can be moved to any angle.

If it is desired at any time to operate the steerer by hand, it is only necessary to loosen the clutch, which is incorporated within the worm wheel, by a few turns of the nut on the end of the screw shaft. This disengages the electric drive and leaves the machine free to be turned by hand.

An electric helm indicator is placed in the stand which supports the control at the bridge and regardless of electric or hand steering the indicator at all times shows

the position of the rudder as the source of current is independent of the ship's electrical set.

Many of these electric steering gears have been installed and have proved satisfactory in every particular. With a few minutes of handling a steerer of this nature one will immediately grasp the advantages due to the simplicity of the entire equipment. Both initial and maintenance costs are claimed to be lower than with other systems.

Electric Deck Capstan

In the electric deck capstan the design of a real, compact machine with clear-cut lines has been accomplished. The drive from the motor to the capstan head is by means of a combination of worm gear and spur gear reductions. This mechanism with the motor, controller and resistance are mounted upon a bed plate over which is placed a housing completely covering all of the working parts and protecting them from the weather and water which might come aboard, provision being made for ventilation of the housing when the machine is in use.

The capstan is so designed that by arranging with the builders at the time of order it can be made to set on the deck, or with flanges so placed that the machine can be set with the top of the housing flush with the deck or the machine proper placed on the deck below the capstan head with an extended shaft driving the head.

New Method of Repairing Canvas Covered Boats

CUT strips of cotton cloth about an inch wider and longer than your tear, then lift up the edges of the tear, melt some Jeffery's special marine canoe glue and paint on the wood. Lay the cotton on the glue and iron it out smooth with a hot flat iron. Give the cotton a coat of glue, lay the canvas in position and iron as before. If the edges are badly frayed give them a special coat of glue, after which give it a coat of shellac and paint any desired color.

By this method you will see that the patch is on the under side of the canvas and all that shows is the cut. After painting, however, the cut will be hardly discernible.

Method No. 2

Melt the glue until it is about the consistency of thick paint. Turn back the edges of the cut and paint the glue on the wood about an inch back all around the cut, then lay the canvas back over the glue and iron with a hot flat iron.

If the edges are badly frayed or far apart, and if it is a bad tear, paint on another coat of glue and lay over this a piece of canvas, cotton or silk about an inch larger than the tear, then iron with a hot flat iron. After this is done give it a heavy coat of shellac and paint any desired color. Jeffery's special marine canoe glue is distributed in the United States by L. W. Ferdinand and Company of 125 Kneeland street, Boston, Massachusetts.

Trade Literature

Tobin Bronze—The American Brass Company, Ansonia Branch, Ansonia, Connecticut.

Tobin bronze is manufactured solely by the American Brass Company, and its exact composition has been kept a trade secret with that firm.

It is claimed, however, that this composition falls within the following limits: copper, not less than 59 per cent nor more than 63 per cent; tin, not less than one-half of one per cent nor more than one and one-half per cent; zinc completes the composition, with small quantities of ingredients to improve the quality. No aluminum, lead or iron is used. The result is an alloy of bright golden color remarkable for its tensile strength, high yield point, toughness and uniformity of texture, and resistance to corrosion.

These properties make Tobin bronze adaptable for a number of marine uses, such as pins for blocks, davits, deck bolts and ship fastenings, disk valves for marine purposes, center boards, rudders, hull plates for yachts, marine instruments, motorboat, torpedo boat, and yacht shafting, propeller blade bolts, and any other use which requires high resistance to corrosion combined with high tensile strength.

The booklet gives specifications for the various standard and special bronze rods, tubes, sheets and plates, and contains a number of interesting facts about the use of bronze and a very convenient selection of tables for conversion from metric to English measure. It is very attractively gotten up, bound in brown pressboard with black and gold stampings.

Wheeler Condensers—Catalog 112C—Wheeler Condenser & Engineering Company, Carteret, New Jersey.

The name "Wheeler Condenser & Engineering Company" has become synonymous with the highest type of mechanical equipment combined with a service cheerfully rendered and backed by a guarantee of good faith.

This catalog of 57 pages, attractively bound in black pressboard with red stamp-

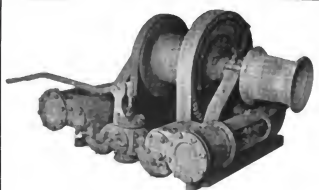
ings, illustrates and describes a complete line of condensers and accessories for stationary and marine service, including Wheeler condensers, vacuum pumps, centrifugal pumps, cooling towers, condenser tubes, feed water heaters, etc. Many of the designs described are of special interest to power plant engineers, since they represent most recent engineering improvement. Among them are: a new design of a 26-inch vacuum surface condensing equipment adapted for engine work and dispensing with combined auxiliary pumps; the Wheeler steam jet air pump with combined inter-condenser and heater operating at maximum efficiency without complicated and expensive accessories; the Wheeler jet condenser with expansion joint between condenser body and a turbine and a centrifugal removal pump having a special vertically split casing. In a section devoted to Crescent brand condenser tubes, the precision that enters into each step of the manufacture of the highest quality tubes is explained. A condenser data sheet is included with each copy.

Rego Welding and Cutting Apparatus—Catalog No. 23—The Baastan-Blessing Company, 125 West Austin Avenue, Chicago, Illinois. An attractive 40-page book with three-color cover describing in detail the various types of Rego welding and cutting torch equipment, the Rego welding and cutting regulators, and special combinations of this apparatus in outfits for various purposes.

A number of special fittings and tools are also listed and considerable data on torch pressures and consumption of gas.

He Is Safe. A mail folder published by the Westinghouse Electric and Manufacturing Company.

This attractive folder describes the Krantz safety auto lock switch of the various types manufactured by Westinghouse, the Krantz safety panels, safety motor starting switches, and floor boxes.



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Two 9 x 9 Heavy Duty
1—9x9 Compound Gearing Throttle Reverse Warring Winch with extended shafts
1—7x9 Enclosed Type Hesse-Martin Steam Capstan
Lifting capacity on single line, 8 $\frac{1}{4}$ x8, 10,000 pounds; on straight line, 9x9, 12,500 pounds, on straight line. All throttle reverse. Piston valves. Gear ratio 5 to 1.

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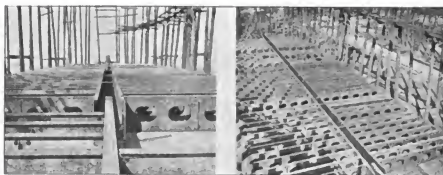
OREGON

THE DUCT KEEL

FOR a number of years past there has been a constant increase in the piping installations on board ship. The number and size of pipes necessary to handle increased services in the way of sanitary, heating and circulating work, and in the carrying of the supply of fuel oil from the tanks to the boiler room or service tanks on motorships has led naval architects into many attempts to do away with the piercing of watertight bulkheads by these numerous pipe lines.

Not a few designs have been brought out during the past twenty years incorporating into the structure of the ship tunnels for pipe service, these tunnels being worked with structural watertight joints at all watertight bulkheads, having vertical access trunks leading to the first deck above the water line, and giving ready accessibility to all pipes installed in the tunnel and at the same time preserving the watertight integrity of all divisional bulkheads.

During the war there was developed in England a very simple solution of this problem called the duct keel. This consisted in a keel of box girder construction which could very readily be incor-



Views of ship framing in a British shipyard showing the application of the duct keel principle.

porated in the design of any existing vessel without detracting in any way from the cargo space and with very little subtraction from the capacity of the double bottom tanks as fuel oil carriers. The construction is so simple that it can readily be incorporated either in the full length of the vessel's structure or in any part thereof.

As will be seen from the accompanying illustration, the duct keel is in reality two keels spaced three feet apart and running free of any cross bulkhead between the keels for the entire, or any part of the, length of the ship. This form of keel construction gives a very great number of advantages. The cargo holds, bilges and tanks are kept clear of piping. The divisional watertight bulkheads are kept absolutely intact. All piping is protected from damage by

cargo without the aid of protective coverings such as are necessary in all hold bilges. The piping is always accessible for overhaul and repair work without moving cargo or waiting in port for cargo to be cleared. The cargo is isolated from all piping and is, therefore, protected from damage due to leaky pipes.

The double vertical keel plates make the ship stronger longitudinally, while at the same time weight is saved in the structure, in piping and in ceiling. The piping can be used in longer lengths with fewer flanges, and no ceiling is necessary for its protection. For this reason the ship is cheaper to build and cheaper to operate, the upkeep of piping being much less and the delays due to damaged pipes being minimized.

Over 150,000 tons deadweight of shipping now on order have the duct keel specified, and undoubtedly many other vessels will be designed for the use of this

simple and eminently practicable construction.

In vessels with machinery amidships such as the eight fast cargo steamers now under construction at the Harland and Wolff shipyard of the Furness Shipbuilding Company, Ltd., the duct keel is used for the accommodation of all bilge and ballast suction pipes and tank heating pipes forward of the boiler room compartment, while those to the after compartments are led along the shaft tunnel. In vessels with the machinery aft the duct keel would be advantageously used for all of the piping to the cargo holds and the tanks in the entire ship.

Structural designs and scantlings for practically all standard cargo vessels incorporating the duct keel idea have received the unqualified approval of the classification societies for the highest rating.

The McNab Company of Bridgeport, Connecticut, U. S. A., are distributing agents for the duct keel in the United States and Canada.



Traveling electric tower cranes installed on the jetties in the new George V dock, London, England, showing the new Babcock and Wilcox luffing gear which is attracting a great deal of attention in European ports and has been found to be very expeditious and economical in handling heavy slingsloads of general cargo.

MARINE UNSINKABLE SAFE DEPOSIT VAULT

COMPARATIVELY recently there was developed and patented a cylindrical burglar-proof, fire-proof and non-sinkable vault for installation on board ship. The experimental work which resulted in this fully developed device was performed under the stimulus to the inventor's imagination lent by the numerous sinkings of ocean-going vessels and especially by the Titanic disaster, when the loss of valuables was estimated at millions of dollars.

The vault is called an ocean-floating safe, and the Ocean Floating Safe Company in Chicago is its manufacturer. This well established firm is installing these safes on ocean liners, either on a rental or a percentage basis, in much the same way that many of the great safety devices at sea, such as the Marconi wireless telegraph, were first introduced into the merchant marine service.

This unsinkable safe is cylindrical in shape. Made of double steel walls, it is

stronger, more modern and more secure than any ordinary safe. The space between these walls is filled with a secret composition hard as cement and as light as cork. It has no air chamber of any kind, and is so constructed that it is absolutely impossible to sink it. This cylinder is secured in a tube or well built into the vessel in such a manner that, in the case of accident to the vessel, as soon as the tube is submerged its cover is automatically released by the water pressure and the safes float out of the tube and remain on the surface until picked up. The tube and its safe may be so installed and so located on either a new or old vessel that in forty-eight hours, without interfering with schedules, it is ready to operate. It takes up no space which would be needed for any other purpose and requires no alterations in the construction of the vessel.

In large passenger vessels the complete system is so constructed that a separate compartment with a separate

safe opens on each deck, each compartment being entirely separated from the others, but still a part of the entire system, permitting easy access in much the same manner as if each deck were equipped with a safety deposit vault.

A substantial amount of personal valuables, jewelry, mail, papers and express matter may be thus carried with perfect assurance that in the event of accident to the ship these safes will be recovered with their contents.

The service plan of the Ocean Floating Safe Company is designed to introduce these ocean-floating safes to steamship companies in a manner that will insure to the steamship company a steady source of income without any initial expense. The company pays for all the initial equipment necessary, makes the complete installation on the vessel and furnishes the personnel to maintain and operate it continuously, dividing the profits with the vessel. This service may, in the advertising matter of the steam-

ship company, be made to recommend itself very highly to passengers and, therefore, be considerable of an advertising asset to the steamship company itself. The safety deposit features offer the greatest source of income; but the service is also intended to cover mail and valuable express packages in such a manner that a substantial increase in tariffs may be made.

The ocean-floating safe has been subjected to a very great number of very searching tests and has proven its ability to remain afloat under the most adverse conditions and to withstand all of the ordinary attempts to which standard burglarproof safes are subjected by the safe-cracker.

Certainly steamship operators should avail themselves of this opportunity to demonstrate their willingness to give every assurance to their patrons of safety to their valuables at sea, especially when the service is offered to them on such a generous basis as this, which guarantees to them an income at no initial expense.

Conditioning the SS. St. Louis for World Trade Cruise

FIVE hundred men are at work reconditioning the steamship St. Louis in readiness for her world trade cruise, beginning in January, 1922, and ending the following December. On this cruise the St. Louis will carry the exhibits of 300 to 350 American manufacturers to the four points of the compass.

The contract for the conditioning of the famous liner was awarded to the Todd Shipyards Corporation by the Anderson Overseas Corporation, owners of the St. Louis. The work will be performed at the Robins Drydock and Repair Company's plant in Erie Basin and will provide employment for hundreds of shipworkers until after Christmas. The actual cost of conditioning the St. Louis has not been stated, but it is believed that it will run into many thousands of dollars. The contract calls for the ship to be complete and ready for sea in the early

part of January.

According to the specifications, the St. Louis will be converted into an oil-burner by the installation of Todd burners and will be equipped with every known modern device for the comfort and safety of her passengers. The arrangement of the ship will differ to some extent from what it was at the time when she was the crack ship of the American Line. Because of the climatic conditions to be met with during the eleven months' cruise, a ventilation system which will serve all the inner and lower rooms in hot countries, and a heating system which will make the same rooms and quarters comfortable in cold countries, have been fully arranged for.

A fully equipped hospital, with isolation ward, operating room, etc., is also included in the plan. On account of one entire deck having been reserved for exhibition purposes, as well as por-

tions of three other decks, great care had to be exercised so that the comfort and safety of the passengers would not be interfered with. One exhibition deck, however, will have uninterrupted space for exhibits of about 550 feet long. This does not include the automobile section, which will carry practically a New York automobile show around the world.

At the offices of the Anderson Overseas Corporation it was stated that strict instructions were given the Todd Shipyards Corporation that the St. Louis when finished must be as modern as any ship afloat, as comfortable as the most comfortable, and as safe as it is possible to make her—the pride of the American nation, whose manufacturers' products she will carry to the four quarters of the globe. The Anderson Overseas Corporation states that accommodation and space on the St. Louis for the world

trade cruise will probably be over-sold by October 15, most of the large cities in the United States having taken an active interest in the project with the aim of having their industries well represented and their cities advertised.

The St. Louis was the first 100 per cent all-steel American steamer ever built, and at the time was the fastest and most modern and the finest ship afloat. She was a product of the famous Philadelphia yard of the William Cramp & Sons Ship & Engine Building Company. She was christened by the former Mrs. Grover Cleveland, President Cleveland and his cabinet attending.

Over a measured course she averaged 22 knots an hour. The term "Ocean Greyhound" was coined to describe her. In 1898 the St. Louis rescued the passengers and crew of the Dutch steamer Veendam 640 miles from Southampton.



Setting the broken nose of commerce

THE oxy-acetylene welding and cutting torches—those twin metal surgeons—are indispensable in ship yards.

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NEW YORK'S BIG MARINE SHOW

Exposition Held Under the Auspices of the Marine Equipment Association of America a Huge Success

MR. J. S. HINES, publisher and owner of *Pacific Marine Review*, writes from New York of the "great pleasure experienced in attending the Marine Show" which was held in New York for six days, November 14 to 19, inclusive. "I was agreeably surprised at the efficient business manner in which this show was conducted. Practically every item in every exhibit was in the nature of a salesman's sample designed for business use. At the executive offices of the Marine Equipment Association, which occupied booths 35, 36, 37 and 38, officials or committeemen of that association were constantly on hand to extend courtesies to visitors or to aid in solving the problems of the exhibitors."

The following brief notices and the illustrations accompanying this article will give some idea of a few of the exhibits.

American Brass Company, Waterbury, Connecticut, exhibited a full line of samples of their brass and composition wire, pipe, screens and sheets. This exhibit occupied booth 75.

American Car & Foundry Company, 165 Broadway, New York, had a very interesting exhibit of their well known line of electric heaters, including the rivet heater, which has come into considerable use recently in shipbuilding and general construction work. This exhibit occupied booth 150, and the company was well represented by F. C. Cheston and W. M. Earl.

American Engineering Company, Philadelphia, Pennsylvania, occupied booths 81 and 96, with exhibits of electric and electro-hydraulic auxiliary machinery, including a 35 horsepower deck winch, an electro-hydraulic steering engine with hydraulic telemotor, an electric windlass, and an electro-hydraulic winch. P. E. Kriebel, marine sales manager, and six assistants did the honors for this exhibit.

American Manganese Bronze Company, Holmesburg, Pennsylvania, exhibit-

ed bronze and manganese bronze propeller blades, and a very instructive display of comparative tests of metals used for casting propeller blades and of photographs of installations. "Messrs. C. R. Spare and C. S. Bower were representing this company at the time of our visit to booth 63."

American Steel Foundries, Chicago, had filled booth 159 with examples of their line of cast steel anchors. "Their genial representative, Mr. A. P. Jones, was kept busy dispensing literature setting forth the advantages of cast steel for this purpose."

Asbestolith Manufacturing Company, New York, represented by Mr. R. C. Burnside, its president, displayed in booth 206 several exhibits showing the adaptability of asbestolith as a protective covering for steel plates on ships' decks and also its adaptability in covering both wood and steel for general construction and building purposes.

Ashton Valve Company, New York, under the super-



A notable exhibit of refrigerating machinery of the ammonia compression type. The chart at left shows by a well arranged color scheme the complete cycle in the refrigeration process with ammonia.

vision of Charles W. Bucklew, exhibited its line of whistles, gauges, testing outfits, and safety and relief valves in booth 219.

Babcock & Wilcox Company, New York, occupied four booths with large draw-

ings on a scale of one-half actual size, showing the details of their various types of boilers. They also had on display numerous models of furnace fronts, oil burners, headers, and a full line of boiler fittings and valves.



The exhibit of the Bethlehem Shipbuilding Corporation featured the marine engineering activities of that firm largely in auxiliary machinery

They had six representatives, including J. Coleman, T. B. Stillman, and E. A. Colson.

Bethlehem Shipbuilding Corporation, Ltd., Bethlehem, Pennsylvania, were represented by K. W. Heinrich, sales engineer, and a number of other representatives from the sales department. Their exhibit occupied four booths and included as a main feature a large showing of the new Bethlehem-Weir line of marine auxiliaries. This line as exhibited consisted of 25-ton evaporator; 14-inch centrifugal pump direct connected to 9-inch by 8-inch vertical steam engine; 9½-inch by 7-inch by 15-inch dual air pump; 3½-inch by 2½-inch by 5-inch feed pump; 8½-inch by 6-inch by 18-inch feed pump; 7¼-inch by 5-inch by 10-inch horizontal fuel oil pump; 10½-inch by 8-inch by 22-inch pair of feed pumps and tank pump body and valve chest, 21-inch by 14-inch by 27-inch feed pump; 7-inch by 8-inch by 18-inch general service pump; 4½-inch by 5-inch by 12-inch general service pump. Other products included were a Bethlehem duplex ram hydraulic telemotor connected up in working order, a complete Bethlehem-Dahl mechanical oil-burning system with pumps and a section of the furnace front; also an exhibit of the complete line of Bethlehem-manufactured marine valves and fittings.

H. E. Boucher Manufacturing Company, New York, with Dwight S. Simpson in charge, exhibited in booths 84 and 93 a line of miniature marine specialties which had been gotten up with the idea of educating schoolboys in marine engineering and interesting them in nautical affairs. This line includes quite a number of types of engines from the single cylinder oscillating to a miniature compound towboat engine, with a line of boilers and bolts to match. Miniature sailboats and power boats run by spring motors and by electric storage battery motors were also shown. The exhibit was arranged somewhat in the nature of a miniature shipyard.

Brunswick Refrigerating Company, New Brunswick, New Jersey, exhibited one of their two-ton steam engine driven compressors complete and in working order. This machine was operated by an



This exhibit of the products of a San Francisco firm featured working models of their efficient oil burning system for marine boilers

electric motor through a friction drive. A ¼-ton compressor also was shown with the crankcase cover removed and half of the cylinder cut away. This was operated by hand to show the action of the various parts and created a great deal of interest among many engineers who had operated such a compressor but never before seen

the inside of one. The walls of booth 135, which housed this exhibit, were decorated with many photographs of vessels equipped with Brunswick machines. Underneath each photograph was posted a diagram showing the layout of the plant from that particular ship. A large chart displayed a diagram colored in green for liquid

ammonia, red for gaseous ammonia and yellow for condensing water. This diagram showed the course of the ammonia in a Brunswick refrigerating plant and the gradual change from liquid to gas on passing the expansion valve.

Chase Metal Works and Chase Rolling Mill Company, Waterbury, Connecticut, rep-



An interesting display of wire, bar and tubing in non ferrous alloys



No soot allowed in this booth

resented by J. R. Griffin and four other members of the sales organization force, exhibited in booth 46 the process of manufacture and the finished product of brass, copper, and bronze in sheets, rod, wire, and tubing.

James Clark, Jr., Electric Company, Louisville, Kentucky, occupied booth 231 with a full line of examples of their portable and stationary electric driven drills, grinding machines and reamers, under the supervision of W. W. Krooper, their sales engineer.

The Coen Company, San Francisco, exhibited a complete fuel oil-burning system, including a duplex pump, their patent air register, and the 1921 model burner and new model cleanable heater. This exhibit occupied booth 136 under the supervision of William Wampler and three assistants.

Crandall Engineering Company, East Boston, Massachusetts, displayed in booth 58 an exhibit of photographs and models of drydock and marine railway installation, in charge of J. Stuart Crandall. There was a great demand for "What Does She Weigh?", a very interesting booklet describing the methods used in estimating the docking weight of any vessel, which Mr. Stuart was kept busy handing out to visitors.

Crane Company, Chicago, filled two booths, 116 and 147, with a complete line of valves and fittings for marine use. This exhibit was in charge of F. C. Bradbury, J. F. Duffy, D. Morgenthal, and G. E. Barker.

Crane Packing Company, New York, staged a most interesting exhibit in booth 232, showing the process of packing surface condensers. In this exhibit actual demonstrations and experiments with various kinds of packing were carried on for the benefit of marine engineers and others interested in the behavior of surface condensers at sea. There was also

exhibited in this booth a complete line of flexible metallic packings, the entire exhibit being under the care of Julian N. Walton and A. W. Payne.

M. T. Davidson Company, New York, exhibited their line of marine pumps, ash ejectors, and other machines. Special stress was laid upon an improved valve gear for vertical marine pumps which is especially adaptable for use with high steam pressures and without internal lubrication.

Diamond Power Specialty Company, Detroit, Michigan, exhibited a full line of working models of various marine soot blowers, including rear and front end blowers for Scotch marine boilers, revolving blower, valve-in-head blower, and right angle drive blower for watertube boilers, and samples of calorized and uncalorized metals which had been tested at high temperatures. F. W. Leahy and F. W. Lambert had charge of this exhibit, which was housed in booth 158.

Ellecon Company, New York, exhibited a line of specialties in marine fittings in booth 127 under charge of William Wampler and three assistants. This line included safety tread stepping for engine and fire room ladders, engine room grating and fire room floor plates; enamel pipes for hand rail, special metal for electric light fittings; curtains for steamships; and reinforced flexible oil tubing for oil-burning furnace fittings.

Fairbanks, Morse & Company, New York, exhibited their oil-burning engines, one of 200 horsepower directly

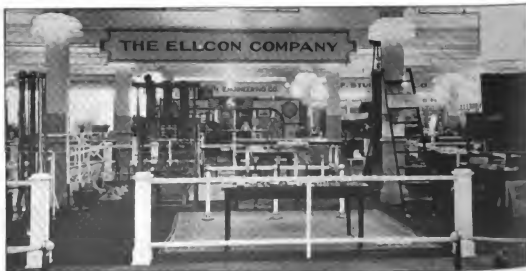
reversible for direct connection to propeller shaft, one of 30 horsepower directly connected to generating set for ship lighting. Included in this exhibit were marine type power pump, marine type centrifugal pump, and a motor driven refrigerating machine of $\frac{1}{2}$ -ton capacity. This exhibit occupied booths 121, 122, 141 and 142, in charge of J. Jernberge and T. Drennan.

Foster Marine Boiler Corporation, New York, had three sales representatives in booth 190 distributing literature on their marine watertube boiler and exhibiting a few of the specialties manufactured by this company, such as keycaps and the special roller tool used in applying these caps.

General Electric Company, Schenectady, New York, had seven representatives in booth 9, using their space only for reception purposes and for the distribution of literature.

Great Lakes, Hudson and Atlantic Waterways Association, New York, occupied booths 47, 48 and 49 with educational displays of charts showing the proposed improvements in water communication between New York and the Great Lakes, and ample supplies of literature designed to interest visitors in the problems of the internal waterways in the northeastern part of the United States.

Griscom-Russell Company, New York, in booths 112 and 151 under the supervision of Robert Colatan and A. S. Hoffman exhibited a full line of their evaporators, distillers, feed water heaters, steam



Enamelled hand rails, safety treads, and other marine specialty fittings displayed by the Ellecon Company



A few heaters, evaporators, distillers and separators which have become very popular in American ships, both naval and merchant

separators, grease extractors, strainers, and oil coolers.

Horne Manufacturing Company, Jersey City, New Jersey, sent L. W. Horne and A. E. Rackliffe, who fitted up booth 199 to display the line of electric fixtures, fittings and instruments, manufactured by them for the marine trade. This line includes mechanical ships' telegraphs, speaking tube fittings, thermostats for fire alarm systems, running light indicators, cargo reflectors, watertight lighting fixtures, and a complete list of marine wiring fittings.

H. J. Hush, New York, exhibited a varied line of small power machinery for use in shipyards, on docks, and on shipboard, including engine derricks, with a special complete hoist unit for New York lighters, a 5-kilowatt direct connected lighting set, three 4-cylinder heavy duty gas engines, an arc welding set, all of which were arranged in booth 21 under the personal supervision of H. J. Hush himself.

International Compositions Company, Inc., New York, exhibited their line of anti-fouling and anti-corrosive coverings and general marine paints with attractive displays of color cards and a very effective set of booklets. This exhibit in booth 60 was in charge of F. W. Petry.

International Mercantile Marine Company, New York, fitted up booths 194 and 195 with a portable moving picture outfit and entertained hundreds of visitors with splendid pictures illustrating sea travel.

T. P. Jarvis Manufacturing Company, San Francisco, represented by Messrs. Owen O'Beirne, Harry Cunningham, J. E. McCauley and M. Appleman, exhibited in booth 230 their system for applying oil-burners to ships' galley ranges.

H. W. Johns-Manville Company in booth 114 exhibited refrigerating machines and

asbestos products for marine purposes, the former of the well known Audifren-Singram type and the latter including the famous Johns-Manville Sea-Ring packing, Kearsarge boiler gaskets, heat insulation of the asbestos-sponge felt type, the vitribores insulation and stacking, air cell insulation, brine and ammonia pipe insulation, anti-sweat insulation, and zero insulation. Johns-Manville refractory cements, monolithic baffle walls and Vulcabeston pump valves were also featured. This exhibit was in charge of R. F. Massa.

Kearsby & Mattison Company, Amber, Pennsylvania, represented by L. L. Barrett and A. Hovey-King, exhibited a general line of asbestos textiles and particularly those entering into the manufacture of "85 per cent magnesite" pipe and boiler coverings and marine gaskets and packings. The exhibit featured a number of steam pipes filled with steam under pressure and with thermometers laid on the outside of the insulating covering so as to indicate the respective efficiency of various thicknesses and types of heat insulating.

Kingsbury Machine Works, Frankford, Pennsylvania, under the personal supervision of Albert Kingsbury with three assistants featured in booths 165 and 178 an exhibit showing marine thrust bearings of the Kingsbury adjustable and equalizing type, with a testing machine especially set up to demonstrate the operation of these bearings and of the new system of air lubrication, wherein it was shown that with this system there was complete separation of bearing faces.

Lee & Simmons, New York, exhibited in booth 12 a complete set of models and photographs of the various types of vessels used in the lighterage business in New York harbor.

Lunkenhimer Company, Cincinnati, Ohio. Brass and composition valves and the name "Lunkenhimer" have been practically synonymous for many years in American marine practice, so that, as would naturally be expected, booth 149 featured mainly



Valves of every type and size were exhibited here, the "Ferrenowo" line being strongly featured



An ash hoist and a hand steering gear which are built for efficient service under hard conditions

gate, safety and check valves. There were in addition, however, oil cups, various oiling devices, grease cups, lubricators, whistles, injectors and various boiler room and engine room fittings, all under the charge of Walter A. Reynolds with four other representatives from the sales department.

Marine Decking & Supply Company, Philadelphia, Pennsylvania. This well known marine supply house occupied booths 200 and 225 with W. L. Peebles and G. W. Selby in charge. Their exhibit featured tackle blocks, shackles and shives, and a general line of ship hardware. They had also a very attractive exhibit of decking and flooring.

Marine Draftsmen's Association, meeting in annual convention in New York City, made booth number 40 their headquarters for the week. The booth was fitted up for reception purposes only, and many of the visiting draftsmen found a keen interest in comparing and analyzing the machines, fittings, and systems on exhibit in the various booths.

Mercantile Specialties Company, New York, in booth 61 had an interesting exhibit showing the working of a safety port hole.

J. S. Mundy Hoisting Engine Company, Newark, New Jersey, under the personal supervision of C. L. Mundy, president, and C. H. Foster, marine manager, staged in

booth 132 an interesting exhibit of their hand steerer. The Mundy ash hoist is built to United States Navy standard requirements and is fitted with a follow-up gear and an adjustable automatic stop so that the bucket is positively stopped at either limit of the desired travel. The hand steerer was designed to fill the need for a reliable hand gear for sailing vessels or for emergency

gear on steamships. It is a right and left-hand screw arrangement with two heavy bronze nuts connected by forged steel links to the massive cast steel cross arm, which may be fixed by removable pins to the cross-head keyed on the rudder stock. The after end of the screw shaft is carried in a universal self-aligning bearing fitted with coil springs inhibit of their ash hoist and

to take the shock of heavy seas.

National Malleable Castings Company, Cleveland, Ohio, had in booth 161 three representatives and an exhibit of several sizes of "Naco" cast steel anchor chain with shackles and swivels, and on display a few broken links, together with microphotographs to show the crystalline structure and charts, diagrams and tables showing the results of tests of cast steel chain.

Newport News Shipbuilding & Drydock Company, Newport News, Virginia, had fitted up four booths to represent a full sized after-bridge with cabin and open deck space and the usual hand rail. The cabin made a gallery for the display of photographs and literature illustrating and describing the harbor facilities of Hampton Roads, and a series of views taken by the Army Air Service showing the bombing of aircraft of old battleships of the German and American navies.

Albert T. Otto & Sons, New York, were represented by Stuart Otto and P. G. Schilling. In booth 155 fitted up as a reception room they exhibited a very instructive and complete line of drawings and photographs illus-



A demonstration of the combination of elegance, comfort and economy made possible by the use of Pantasote products

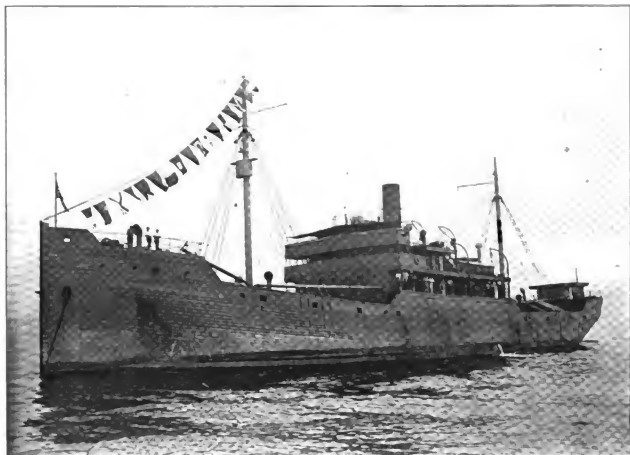


Photo by
Edna Lovick,
N. Y.

ONE of the Emergency Fleet wooden steamships that may soon be sold at bargain prices.

Over 80% of these boats are caulked with *Stratford Oakum* which made a war record of not a single complaint or rejection and receives the highest approval of both Lloyd's and American Bureau.

Stratford Oakum contains least waste, requires least labor, and is the best and most economical caulking material to be had at any price.

George Stratford Oakum Co.
JERSEY CITY, N. J.



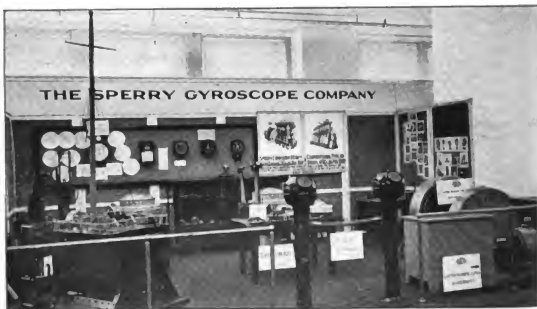
burner by a pump. A bypass valve was arranged on the return line and located at a point near the booth rail so that it could be operated. This valve controlled the quantity of fluid delivered at the burner tip. It was readily demonstrated that the burner gave perfect atomization at all points from 15 per cent up to full load. There was also a complete burner and register mounted on the furnace front of a marine boiler.

Pneumercator Company, Inc., New York, had a very fine exhibit showing various types of the Pneumercator gauge for ships' draft, for depths of liquids in tanks, and also their electric whistle operator. This exhibit was housed in booth 14 under the care of Gardner Corbett and Harry S. Parks.

trating Diesel engines and air compressors.

Pantasote Company, New York, filled booths 162 and 181 with exhibits of bulkheads, floor coverings, and ceilings made from its products in various attractive patterns and colorings. Included in this exhibit was a model ship stateroom lined with Vehisote. This firm was represented by H. G. Lake.

Peabody Engineering Corporation, New York, represented by W. A. Ebsen and J. P. Leask, in booth 154 exhibited their new wide range mechanical atomizer fuel oil burner. This burner was arranged to spray water instead of fuel oil into a glass box so that its operation could be observed by all visitors. Water under constant pressure was delivered to the



Power Specialty Company, New York, exhibited superheaters, featuring a complete element with core illustrating the method of closing handhole openings in header. J. J. Nellis and J. C. McKenzie distributed much literature describing this company's products.

Row & Davis, Engineers, Inc., New York, filled booths 73 and 104 with an exhibit of evaporators, feed water heaters, oil heaters, and grease extractors under the personal supervision of H. C. Davis and R. R. Row.

Scovill Manufacturing Company, Waterbury, Connecticut, put up a very attractive exhibit in booth 111 under



Brass tubing effectively displayed

the supervision of P. Davidson and two assistants, featuring brass tubing and especially Scovill Admiralty condenser tubing, which is made of a special mixture consisting of 70 per cent copper, 1 per cent tin, and 29 per cent zinc, mixed and manufactured into the finished product in such a manner as to conform with all of the highest specifications for U. S. Navy standards. A very attractive booklet, "Tube Facts," was distributed from this booth.

Shepard Electric Crane & Hoist Company, Montour Falls, New York, exhibited a 1/2-ton and a 1-ton capacity overhead monorail direct lift hoist. The booth, No. 126, was in charge of A. J. Barnes and G. G. Habershaw.

The Show headquarters for the American Society of Naval Architects and Marine Engineers were in booth 39.

Sperry Gyroscope Company, New York, exhibited a gyro-compass in actual oper-

ation in connection with one of their new continuous course recorders and an electric log. There was also the model of a gyroscopic stabilizer now building for an 18,000-ton passenger liner. This model was in operation and demonstrated in a practical, visual way the results of stabilization. Pictures of the new Sperry compound Diesel engine and a working exhibit of one of the company's new electric clutches were also featured. This exhibit in booth 15 was under the personal supervision of Mr. Robert B. Lea of the merchant marine sales department, with four assistants.

Stamford Foundry Company, Stamford, Connecticut, represented by Frank W. Brant, exhibited an interesting line of cooking ranges for ships' galleys in booth No. 226.

B. F. Sturtevant Company, Boston, Massachusetts, filled two booths, No. 94 and No. 95, with examples of their

forced draft direct connected steam driven fan units for the United States Navy, a 5-K. W. direct connected gasoline engine generating set, a vertical steam engine, a steam turbine for auxiliary pump drive, and a portable ventilating set. Eugene B. Williams and Edward L. Moran had charge of this exhibit.

Sun Shipbuilding Company, Chester, Pennsylvania, displayed two very fine models and a large number of photographs showing their plant and its products. They were represented by J. T. Borden and J. W. Hudson.

Superheater Company, New York, exhibited a model of their firetube superheater for Scotch marine boilers, a model of their superheater as applied to marine watertube boilers, a boiler feed pump, and a pyrometer for measuring steam temperatures. Seven members of the staff of the marine department of this company were detailed

to supervise this exhibit and to make all visitors to the Marine Show feel at home in New York.

Texas Company, New York, filled booth 105 with an attractive line of samples of their marine lubricants. Nine members of their sales and advertising departments were on hand to demonstrate perfect lubrication.

Todd Shipyards Corporation, New York, were represented by William H. Raab and H. Nightengale. They exhibited their famous model of the 6-section floating drydock known as No. 4 of the Robins Drydock & Repair Company, with the model of a modern ocean liner on the dock. This model is complete in every detail, measures 11 feet 6 inches overall, and attracted a great deal of attention from visitors. The Tietjen & Lang Company and the Tebo Yacht Basin Company exhibited the scale model of a 750-H. P. marine type Diesel engine fitted for electric drive and a geared turbine drive in position in the engine room of a modern steamship. There was also a 12-foot over-all model of an oil-burning fruit and passenger liner recently built at the Tebo plant. The White Fuel Oil Engineering Corporation exhibited a Scotch marine boiler fitted with the latest improved Todd-White oil-burning system.

United States Navy, Washington, D. C., occupied fifteen booths with exhibits in charge of Michael D. Shaefer, including models of various types of navy vessels, paintings of historic deeds, citations, Liberty motors and propellers, Lewis, Browning and Colt machine guns, photographs and charts showing recreational, athletic, hygiene, piloting, radio station, and educational work.

United States Shipping Board, Washington, D. C., under the supervision of W. W. Harrison in booths 54 to 57, exhibited model staterooms and a full scale model

OCEAN SHIPPING

by

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of one of the new combination American Legion class Shipping Board liners.

Valentine & Company, New York, staged an exhibit designed to show the quality of their varnishes under the action of hot and soapy water. This consisted of a number of panels finished by Valspar and with other varnishes, over each of which a stream of hot water flowed; also of a washing machine with a glass front in which a panel made up in the form of a submarine and finished with Valspar was subjected to a continual spray of soapy water. There was also a table whose top was finished in strips of mahogany, oak and other stains made by the Valentine Company upon which boiling water was poured to demonstrate the ability of these stains to withstand such usage. This exhibit occupied booths 64 and 65 in charge of Dornier Walker.

Victor Engineering Company, Philadelphia, Pennsylvania, exhibited its ash ejector, which is operated by a special steam nozzle. This ejector especially commends itself in coal-burning vessels on account of the small space occupied in the boiler room, the taking of ashes through the boiler room floor without lifting, the impossibility of flooding the bilge or boiler room by its use, as no water is employed. The Victor ejector will handle clinkers up to 5 inches and will discharge a ton of ash in about



A full size working model of the Victor ejector which simplifies the handling of ashes in coal-burning ships

12 minutes with one man feeding. It is operated by one bar or rod which controls the sea gate, the valve on sanitary water line, the automatic valve on the steam nozzle, and so interlocks every action of the ejector as to make it positively fool-proof. This exhibit in booth 191 was under the charge of Eugene Hahn and C. L. Bachman.

Wager Furnace Bridge Wall Company, New York, exhibited in booth 117 their patent bridge wall for marine furnaces, a large number of which have been supplied to and are operating in ships of the American merchant marine, both for the United States Shipping Board and for private owners. The Wager Furnace Bridge Wall Company were

represented by Louis F. Fenwick and Alexander Halley.

Elisha Webb & Son Company, Philadelphia, Pennsylvania, had an attractive exhibit of galley equipment in booth 59 under the personal supervision of Elisha Webb. This display included steam tables, ranges, lights and mess kettles.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pennsylvania, filled six booths under the supervision of W. H. Easton, with a display of their marine products. One novel feature and one of the most interesting items of the entire exhibition was the wireless receiving set with loud speaking attachment which transmitted to exposition visitors the marine news, concerts and other messages as broadcasted by the Westinghouse Company's high-power radio station at Newark, New Jersey. In this ex-

hibit also were many models of turbine gears, turbines, Diesel electric equipment, electric deck machinery, and a moving picture exhibit showing the manufacture of marine machinery in the company's shops.

C. H. Wheeler Manufacturing Company, Philadelphia, Pennsylvania, exhibited many types of air pumps, condenser pumps and their accessories, and an interesting example of their dynamometer especially adapted for testing Diesel engines. This was in booth 13 under the supervision of C. H. Lang.

Worthington Pump & Machinery Corporation, New York, occupied booth 146 and were represented by W. A. Cather, M. L. Katzenstein and four other members of their sales organization. They exhibited a number of types of centrifugal and vertical simplex and duplex pumps for marine boiler and condenser service.



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Excerpt from Denver Post, Denver, Colo., Nov. 2nd, 1921:

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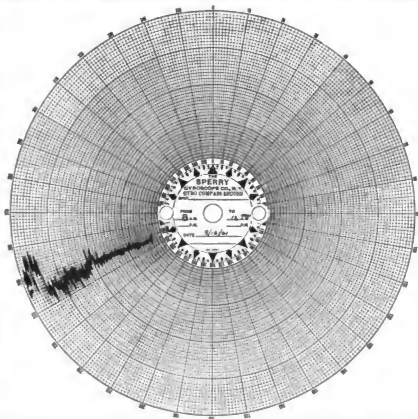
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Trade Literature



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Bulletin No. 3A, James Howden & Company of America.

A six-page folder describing the Howden double-acting, high-speed, forced lubrication, enclosed steam engine, as especially adapted for direct coupling to electric generators for ship lighting.

These engines can be supplied separately or directly coupled on a common bedplate to direct current 125 to 250 volt generators. They are manufactured in eight sizes, ranging in capacity from $7\frac{1}{2}$ to 20 kilowatts.

James Howden & Company, Ltd., of Glasgow, Scotland, began the manufacture of this engine about eighteen years ago in shops especially built for that purpose. The engine at first was used principally in connection with the Howden system of forced draft in driving fans for supplying air to the furnaces of marine boilers. Its use was gradually extended to ventilation and the generation of electric power, and thousands of these engines are now in use all over the world. In the fall of 1918 James Howden & Company of America, Inc., established a plant at Wellsville, New York, for the manufacture of this engine and other products in connection with their forced-draft system.

The manufacture is standardized under the limit gauge system. All surfaces are designed so as to give ample areas and extremely low working pressures, and it is claimed that there has not been a single case of renewal of the crosshead slipper due to wear. The idea of James Howden & Company in manufacturing these generating sets for the marine trade is that the use of the same size and type engine for lighting and for forced draft makes it possible for the marine engineer to get along with a smaller stock of spare parts.

The illustration on the cover of the bulletin shows eight 15-kilowatt and 110-volt 500 R.P.M., D. C. generating sets supplied on one order to the Kiangnan Dock & Engineering Works, Shanghai, China, for use on ships building by that yard for the United States Shipping Board.

Specialized Pipe Service—American Spiral Pipe Works, Chicago.

An eight-page, profusely illustrated folder setting forth the advantages of American spiral pipe and illustrating some typical installations. This product has been largely used in hydro-electric power station work, city water works, and dredging operations in the United States, Canada, various South American countries, and Europe.

The American Spiral Pipe Works' specialty is spiral-riveted, pressure pipe. In developing joints for this pipe they have produced a very excellent pipe flange of forged steel which they can supply to order in any size or weight. They also manufacture an excellent quality of lap-welded steel pipe. Our readers will, however, be more interested in their corrugated furnaces for Scotch marine boilers, many of which have shown excellent service qualities at sea in the boilers of ships built for the Emergency Fleet Corporation of the United States Shipping Board.

Bulletin No. 15—The Silent Hoist Company, Brooklyn, New York.

A six-page folder featuring two self-contained engine-driven hoisting units, the Model D-5 friction drum hoist and the Model D-10 vertical capstan winch. The Silent Hoist Company are the pioneer manufacturers of worm-drive in this class of machinery.

The 5-horsepower gas engine-driven friction drum hoist illustrated in this folder is a self-contained unit on a single bedplate consisting of a 5-horsepower new-way air-cooled gasoline engine connected by a silent chain drive, a worm and worm wheel, to the hoisting drum. The drum has a capacity for 500 feet of one-half inch cable. At a line speed of 100 feet per minute the engine will give a 1600-pound pull on the rope. Over-all dimensions are 25 by 69 inches. The weight of the unit is 1100 pounds. This same unit can be furnished geared for a 4000-pound lift at 40 feet per minute.

Trade Literature

The vertical capstan, Model GT-10, has practically the same specifications as the friction drum hoist, with the exception that the worm wheel is mounted on a vertical shaft driving a vertical capstan head with a lifting capacity of one ton on a single line of 50 feet per minute. This machine makes a very efficient hoisting or hauling unit for riggers, wreckers, house movers, or general contractors.

Coes Genuine Screw Wrenches—The Coes Wrench Company, Worcester, Mass.

Eighty years ago Loring Coes invented the original screw wrench, and from that time to the present day he and his descendants have been making wrenches of quality for the mechanics not only of the United States but of practically the entire world.

At this late day it seems to be superfluous to be calling the attention of the readers of a technical journal to such a standard product as the Coes wrench. There have, however, been constant improvements in this product, among them being the steel handle wrench especially adapted for heavy duty. This wrench is becoming the standard equipment of many railroads and mining companies and is practically a weather-proof, foolproof, unbreakable tool. The bar and head are of special steel, finished hot and water-forged, carefully heat treated, and with all wearing surfaces hardened. The jaw is a semi-steel casting in one piece. The screw with its knurled head is in one piece, the thread being especially designed of ample section to withstand hard usage. A ball race is machined on the head of the screw to take a ball set in a socket in the bar. This ball race is polished, and the ball is standard steel ball such as is used in ball bearings. The handle is a semi-steel casting of special design, the hole for the bar being broached to a drive fit and the handle being fitted under pressure. Comparative tests have shown that this wrench will stand a greater strain than any screw wrench made. Eight sizes are manufactured, ranging from 4 to 21 inches.

For larger sizes up to 72

inches the Coes Wrench Company manufacture a key model. This was first developed and is still very largely used for handling work in reseating large valves. The 72-inch size has a maximum jaw opening of 12 1/4 inches. This extreme size was taken off the manufacturing list as a war conservation measure and has not been returned to stock. Specifications and deliveries on this or larger sizes can be had on request.

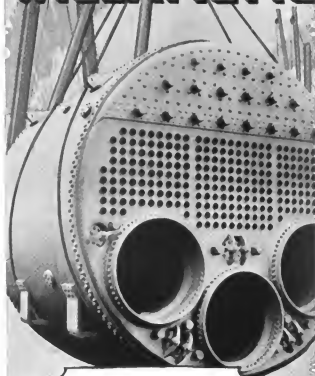
Kolster Radio Compass and Position Finder—Bulletin No. 12A of the Federal Telegraph Company, San Francisco.

Much attention has been given recently by navigation experts to the safeguarding of ships and their passengers while navigating in fog. Light and sound signals from United States lighthouses and lightships have proved extremely unreliable in dense fog, and it is proposed under the Kolster system that automatic radio stations be installed on lightships, at lighthouses, and in various situations in the vicinity of harbor entrances and dangerous channels. These radio stations would send out characteristic signals in the same way that lighthouses now send out flashes of light. Fog is no barrier to a radio signal. Vessels equipped with radio compass can under the Kolster system immediately get the bearing and the approximate distance of the sources of these radio signals.

It is true that under the present navy system vessels can get their bearings from the naval radio stations, but to do so they are dependent on two or more operators ashore and are liable to interference caused by many ships trying to get bearings from the same station. With the radio compass aboard the vessel and automatic radio signals coming in from the lighthouse or lightship of known location any number of vessels can simultaneously establish their position without interference or delay. Radio compass bearings can be taken with the Kolster radio compass as easily and as quickly as they can by pelorus sighting.

The cost of a complete installation of this system on

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R EINFORCED by wide experience covering many important marine operations, the Willamette plant is well prepared to undertake and complete your work with satisfaction, economy and dispatch.

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The McIntosh & Seymour Diesel-engined motorship Cethana

shipboard is so small when compared with the benefits which may be derived that it would seem the part of ordinary commercial sense for every shipowner to seriously consider this system as part of the navigation equipment of his vessel. No special training is required for the care and operation of the installation on shipboard or that in the lighthouse or lightship.

Achievement in Motorships—
McIntosh & Seymour Corporation, Auburn, N. Y.

A forty-page book profusely illustrated and bound in part-colored pressboard with

gold stampings, setting forth the Diesel engine as built by the McIntosh & Seymour Corporation and applied by them to marine propulsion.

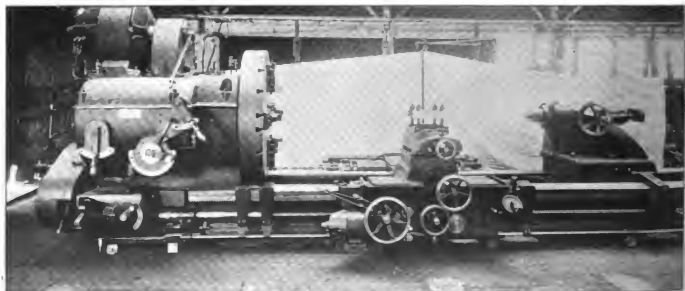
The McIntosh & Seymour Corporation have been building engines since 1885. In stationary steam engines of large sizes this company was probably more successful than any other firm in America. In 1913, recognizing the tremendous advantages of the Diesel principle in prime movers, the firm made arrangements with the Aktiebolaget Diesels Moter of Stockholm to build Diesel engines from the designs of this Swedish firm. In these de-

signs McIntosh & Seymour embodied certain features which were known to them to be advantageous in American practice. From the first in their Diesel engine practice for marine use McIntosh & Seymour have built only slow-speed 4-cycle engines. There are now in service equipped with these engines 24 ships, all of which have given excellent results in operation even under adverse sea conditions.

The present plant at Auburn covers 12 acres, has direct track connections with both the New York Central and the Lehigh Valley railway systems, and is so ar-

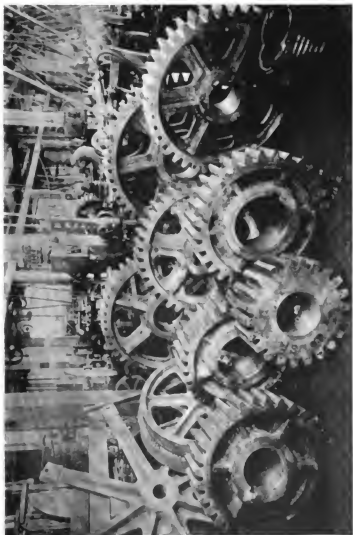
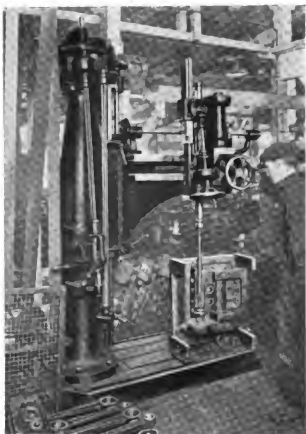
ranged that the raw materials are received at one end of the plant and passed through the various processes of manufacture until the finished parts are assembled, the engine erected and tested, and the complete product shipped from the other end of the plant with a minimum of handling of materials.

The firm is especially proud of its foundry, which is of the daylight pattern, the walls being entirely of glass, and is equipped with the most modern and efficient molding machinery for turning out the high-grade of iron castings which are so necessary to the successful manufacture of Diesel engines.





Above is shown one end of the lounging room of the S. S. America as reconditioned by the Morse Dry Dock & Repair Company. Below, a group of gears and blanks at the shop of the Pacific Gear & Tool Works. Note: We know very well that this illustration is on edge. We placed it that way to attract attention.



Ship Repairs by Experts

Builders of Seventeen steel vessels,
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sels up to 15,000 Tons.

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PORTLAND

OREGON

THE NIPPON YUSEN KAISHA

IN the October issue of Pacific Marine Review we published an article telling a little of the history and work of the Nippon Yusen Kaisha, which had then recently celebrated the twenty-fifth anniversary of its Seattle services. The following additional detailed information may be of interest to our readers.

The S. S. Mikke Maru, Captain Young, sailed from Yokohama for Seattle August 5, 1896, stopping at Honolulu for two days for coaling and arriving at Seattle three p. m. August 31, 1896, at the old Arlington dock. She sailed from Seattle on her return trip to Japan at one p. m. September 6, 1896. Since 1896 the N. Y. K. has maintained regular freight and passenger service to and from Japan.

From 1896 to the present time a total of 608 steamers of 3,732,149 gross tons have arrived at Seattle under the N. Y. K. flag, while 593 vessels of 3,657,149 gross tons have sailed from Seattle. The total of arrivals and departures of N. Y. K. steamers is 1201 vessels of 7,389,298 gross tons. By way of comparison, this total gross tonnage is nearly the same as the total gross tonnage of all American seagoing merchant vessels of 500 gross tons and over employed in foreign trade on October 31, 1919.

The cargo carried during this period amounted to over 2,500,000 tons of the imports and 3,000,000 tons of exports, or a total of 5,500,000 tons. To obtain the significance of this figure, it is interesting to note that the weight of the forty-two-story L. C. Smith building is 32,650 tons, and the service by N. Y. K. vessels to and from the Orient in the period of twenty-five years is equivalent to moving the Smith building to or from the Orient 170 times.

The regular passenger service of the N. Y. K. was inaugurated with the arrival of the S. S. Kamakura Maru, June 26, 1901. Previous to this time a few passengers were carried, but the S. S. Kamakura Maru was the first regular passenger of

steamer employed on the Seattle-Orient Line. The total number of passengers carried by vessels of this company to and from Seattle number over 140,000. This is equivalent to over one-third of the present population of Seattle or the present population of Spokane plus one-third of Tacoma's population. Standing single file, these passengers would form a line over fifty-three miles in length.

During the period that the N. Y. K. has conducted business in Seattle many millions of dollars have been spent in this city. To give an idea of the expenditures it may be noted that in the last four or five years over \$4,000,000 has been spent in taxes alone.

An interesting sidelight on this amalgamation of companies is given in a reported interview with Viscount Okuma, who states that when he went down to Nagasaki in the capacity of president of the Formosan

Aborigines Punitive Expedition Affairs he found himself in a ridiculous situation because the expeditionary forces were ready for departure, and no provision had been made by him for vessels to take them across the intervening sea. For this purpose he chartered American and British ships but was immediately stopped in the use of these ships by protests from the British and American governments, the Island of Formosa being at that time Chinese territory. The captains were ordered by their respective ambassadors not to lend their ships for such a purpose. Okuma thereupon determined without the consent of his government to purchase several of the American steamers. This move was afterward endorsed by his own government after considerable discussion and criticism.

The point that we wish to make is that in the mind of Okuma this incidental purchase of foreign vessels was really the beginning of the modern Japanese seafaring business, which eventually developed into the Nippon Yusen Kaisha.

Air Seasoning

A Study of Its Application in the Lumber Business

IN co-operation with the sawmills and wood utilization plants throughout the country, the Forest Products Laboratory, Madison, Wisconsin, is organizing an extensive field study on the air seasoning of wood. This study, it is believed, will be of extreme interest to the lumber manufacturer and to the wood-using industries. The purpose is to determine the piling practice which will result in the fastest drying rates consistent with the least depreciation of stock, the least amount of required yard space, and the least handling costs. The study will be carried on concurrently on both hardwoods and softwoods. All the important commercial woods of the United States will eventually receive consideration.

The air seasoning of wood is an old practice. No systematic attempt has ever been made, however, to work out the exact conditions under which drying time and drying costs can be reduced to a minimum. It is not actually known which of the numberless methods of piling will give the quickest and the cheapest results under given climatic conditions. The new project will furnish a comparison of the effects of such piling variables as sticker

heights, the spacings of boards in layers, the heights of pile foundations, and the directions of piling with relation to prevailing winds and yard alleyways.

The study is expected to decide whether from a business standpoint lumber should be dried partly at the mill and partly at the plant of utilization, or whether it should be completely dried at the mill. The data collected will also go a long way toward showing whether air seasoning or kiln drying is the more profitable.

A tentative working plan of the air seasoning study has been prepared by the Forest Products Laboratory, and copies are being sent to the secretaries of the various lumber and wood-using associations, state foresters, forest school heads, and others eminently qualified to comment on the plan.

Co-operation in the air seasoning study is being offered on every side. As yet the plants at which the work will actually be done have not been definitely chosen, but the extreme interest already manifested indicates that there will be no difficulty in securing co-operation with plants ideal for the study. Actual field work will soon be well under way.



Safeguarded by
"NACO"
ANCHOR CHAIN CABLE



The WEST LEWARK is one of five 11,000 ton flush deck steel freighters recently built by the Los Angeles Ship building & Dry Dock Co., for the U. S. Shipping Board.

All five vessels are equipped with

"NACO"
Anchor Chain Cable.

THE NATIONAL MALLEABLE CASTINGS CO.

CLEVELAND, OHIO

BALL MILLS AND CRUSHERS

Built at a Southern California Marine Engine Shop

THE Llewellyn Iron Works' ball mill is a new departure in the construction of this class of machinery in the feature that the mill shell and heads and gears are of steel castings instead of cast iron. The trunnions upon which the mill revolves are extra large in diameter, giving a long life to these bearings. All parts are built heavy and strong in order to make a machine that will give long service under severe working conditions with a minimum amount of repairs and attendant shut-downs.

The ball mill is the most modern and approved type of machine for fine grinding ores for treatment by the cyanide or other leaching process and for concentrating by gravity or floatation and for fine grinding cement clinker.

The barrel of the mill is lined with renewable steel wearing plates and hard steel balls are used for crushing and grinding. These balls as a rule are about 5 inches di-

ameter, but the correct size to use is determined by the hardness of the ore or rock to be ground.

The ball mill illustrated is 6 feet diameter by 6 feet long and has a capacity for crushing about 300 tons of ordinary ore from $\frac{1}{2}$ inch size to 24 mesh in 24 hours.

The crusher shown is of the Blake type and is of all steel construction. The design of this crusher embod-

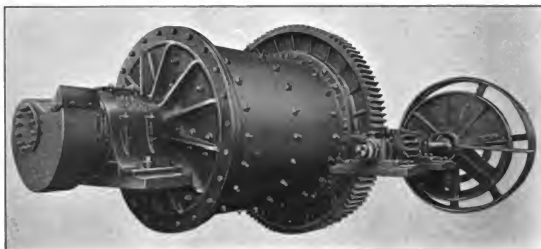
ies some new features among which is the system of lubrication. The bearings are provided with large grease cups which are cast integral with the parts they lubricate. This prevents their ball mills in all commercial and customary sizes from being knocked or rattled off. A grease pressure of several hundred pounds per square inch may be attained which insures forcing dirt and old grease out of the bearings and new grease in.

The system of jaw-plates

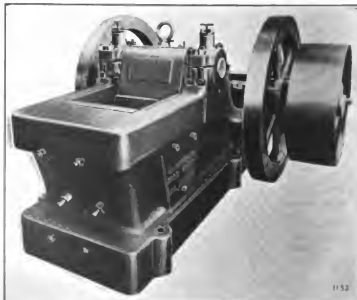
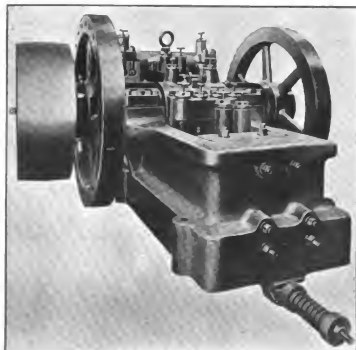
is worthy of attention, inasmuch as the jaws are so placed in the crusher that both jaws are alike and of such construction that from two to three times the amount of jaw plate material can be worn out than with crushers of the standard design.

The crusher illustrated has a jaw opening 18 inches by 24 inches.

Llewellyn Iron Works is building these crushers and the smallest to the largest commercially practicable.



Cast steel ball mill built by the Llewellyn Iron Works of Los Angeles for the Arizona Standard Copper Company. This mill weighs 30 tons



Two views of an all steel ore crusher built by the Llewellyn Iron Works of Los Angeles for the Arizona Standard Copper Company. This crusher weighs 20 tons

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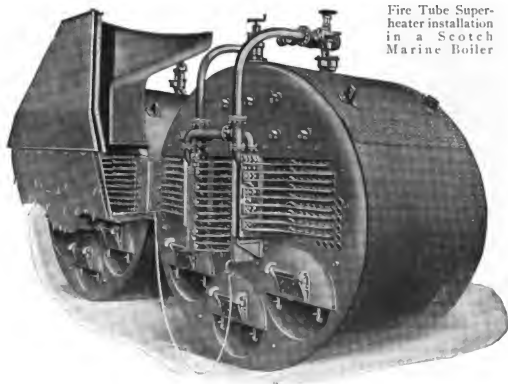
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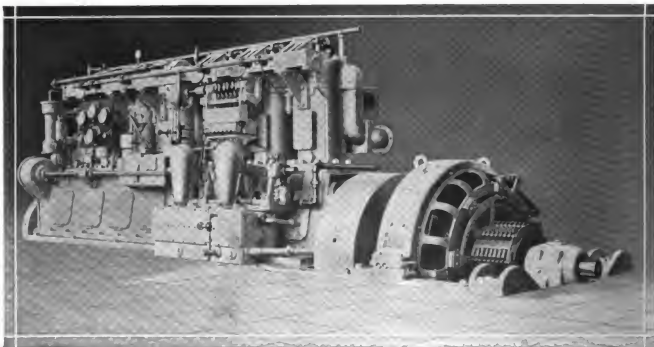
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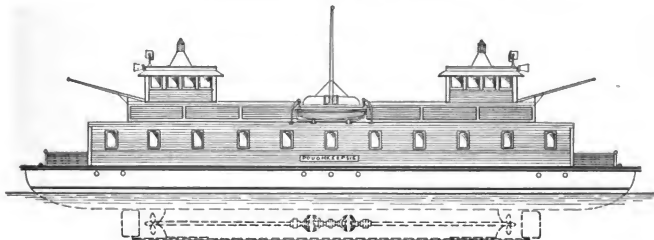
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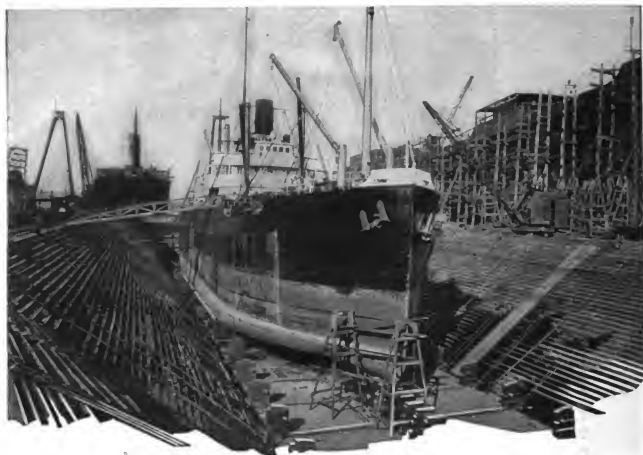
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PALCO is made of a one grade of high tensile strength steel. Lubricated with graphite grease and oil. Superior to any other flax packing.

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Very durable.

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Sole Manufacturers

108 DUANE ST

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MAJESTIC
WORLD'S LARGEST
STEAMSHIP

De Laval Oil Purifiers will protect her machinery and economize on oil

The new White Star liner Majestic displaces 56,000 tons, develops 91,000 horsepower and will easily maintain a speed of 26 knots under favorable weather conditions. Her builders are insuring her machinery by installing De Laval Oil Purifiers to maintain the purity of her lubricating oil.

They know that besides giving her machinery longer life, the De Laval's will quickly pay for themselves by the saving of oil they effect. On the Majestic it will never be necessary to pump used oil overboard. Instead, after each period of use, it will be passed through the De Laval Oil Purifiers and returned to the lubricating system with its efficiency equal to new.

De Laval Oil Purifiers are protecting the vital parts of more than 700 marine power plants. More than 300 of them are used on U. S. naval vessels alone, where they have proved their ability to stand up under the most severe service conditions.

De Laval Bulletins Nos. 102 and 103 tell how you can safeguard machinery and save oil on your ships by the De Laval Method. Write for them.

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Chadburn's (Ship) Telegraph Company, Ltd., Cyprus Road, Beale,
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Turbine Equipment Company, Toronto, Ontario, Canada



Sooner or later you will use a
De Laval

TODD SYSTEMS - WHITE

**EFFICIENCY
SIMPLICITY**



**RELIABILITY
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*TODD MECHANICAL OIL BURNER
is the finished product of years of untiring
experimentation and development in burning
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On Vessels of the Leading Steamship Companies
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INSTALLATIONS
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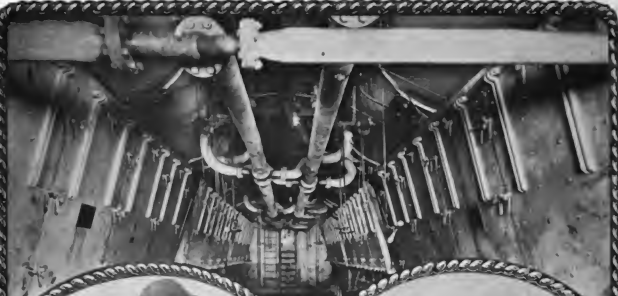


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THE BABCOCK & WILCOX BOILER WITH COVERS REMOVED SHOWING ARRANGEMENT OF TUBES AND DRUMS



BABCOCK & WILCOX MARINE BOILERS AS INSTALLED IN THE MATSON LINERS.

THE STEAMSHIP MAUI, FLAGSHIP OF THE MATSON FLEET, BUILT IN SAN FRANCISCO AND EQUIPPED WITH BABCOCK & WILCOX MARINE WATER TUBE BOILERS.

BABCOCK & WILCOX

MARINE WATER TUBE BOILERS

We have boilers installed in the merchant service on the Pacific Coast in 1897, in active service today. Twelve successive orders from one company; 7 from another; 6 from a third; 4 from two others, and 3 from six others.

These boilers hold the record for economy, capacity and endurance in the Navies of the World.

They have shown the same characteristics in the Merchant Marine. Babcock & Wilcox Boilers and Superheaters in one vessel are saving more than 15 per cent over Scotch boilers in sister vessels.

Babcock & Wilcox Boilers have all essential parts heavier than corresponding parts in Scotch boilers, giving greater security against corrosion. They are lighter, safer, easier to clean and to operate than Scotch boilers, and much more efficient.

THE BABCOCK & WILCOX CO.

New York

CHAS. C. MOORE
Pacific Coast Manager

San Francisco

Sheldon Building, First St., cor. Market

SAN FRANCISCO, CAL.

What Balsa Insulation Means to the Shipowner and Shipbuilder

BALSA insulation is economical in maintenance of refrigerated ship spaces and practical in the simplicity of its installation. It provides solution for the many difficulties heretofore encountered in construction and upkeep. By the use of Balsa full insulating values are maintained, without replacement, year after year; there is a saving of as much as fifty percent of the weight of the insulating structure; thinner walls increase the available cargo space; and the original cost of the completed structure is less than with other good materials.



In the last eighteen months more than a million board feet of Balsa insulation have been installed following the thorough development of its use during the last ten years. Methods of treatment that retain the high insulating value of this lightest of all woods, have been fully proven. Standard plans of installation have been established. Balsa has met successfully all those tests and conditions to which an extended period of actual use has subjected it. Its use has brought about a new appreciation of the possibilities of economical ship insulation.

ADVANTAGES OF BALSA SHIP INSULATION

- 1 Balsa is supplied in large panels having a structural strength fully half that of spruce.
- 2 Balsa requires little studding and only a single layer of sheathing for surface protection.
- 3 Its resistance to heat transmission is equal to that of other high grade insulating materials.
- 4 Balsa is even lighter than cork, and the weight of a completed installation is fully 50% less.
- 5 Permanence of structure and of insulating efficiency is obtained through exclusion of moisture.
- 6 Balsa panels are easily installed, a small number of tight fitting joints minimizing heat leakage.
- 7 Removable sections can be installed to permit ready inspection of ship's hull for painting or repairs.
- 8 Metal sheathed Balsa panels are available for insulation of boiler room hatches and crew quarters.

An article which appeared in the July, 1921, issue of International Marine Engineering, describing Balsa ship insulation, and including detailed drawings showing standard plans of installation, has been reprinted for distribution to those interested. May we send you a copy of this article?

American Balsa Company Inc.
305 Vernon Ave., Long Island City, New York

MOTOR SHIPBUILDING

The "Shipping Monthly" (Liverpool, England) States the Following:

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MOTOR SHIPBUILDING. The motor-ship continues to grow in favor with British owners and builders, and the progress made during the last few years is demonstrated by the returns of Lloyd's Register of Shipping, which shows that at the present time there are 1,447 motor ships afloat, totalling 1,263,000 tons gross; in 1914 there were only 290 motor ships of 234,000 tons. There are now 183 oil-engined craft being built under Lloyd's survey with a gross tonnage of 502,944, and most of these will be completed within the course of the next twelve months. Since the Armistice Great Britain has moved ahead as a motor shipbuilding country in a very satisfactory manner, and of the vessels being built a gross tonnage of 241,003 is under construction in yards in the United Kingdom. The Clyde easily leads the way as the center of this new development, for there 27 vessels totalling 173,630 tons gross are now in course of construction, a large proportion of them being represented by the activities of Harland & Wolff.

Foreign shipowners are not behindhand in recognizing the value of the motor propelled vessel. Two sets of engines, built by a Danish firm, under license from Messrs. Burmeister & Wain, are being installed in a new craft at Hamburg, and this vessel is the first oil-engined ship of any considerable size constructed in Germany since the conclusion of the war. At the Deutsche Werft Hamburg yard, 10 motor ships are under construction, and the Hamburg-Amerika Line, who are very interested, are said to contemplate placing fresh contracts. A Scandinavian firm have just finished a 4,500 ton motor ship for the Swedish Lavant Line. *It is somewhat remarkable that American firms have not taken kindly to the Diesel engine, although the possibilities of that means of driving vessels are becoming more recognized in the United States.* The Scandinavian people and the German firms will prove the strongest competitors of British motor shipbuilding companies, but they will find it no easy task to overtake the ground which British firms have covered, and, so far, successfully applied themselves to.

D
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Will Help Build an American Motorship
Merchant Marine

New London Ship and Engine Company

Works -Home Office,
GROTON, CONN

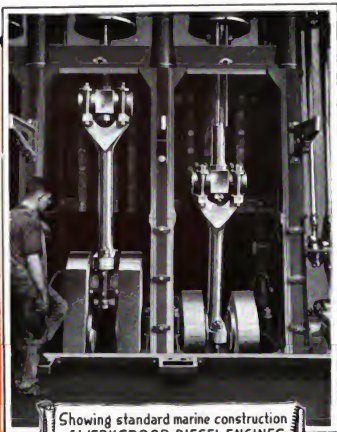
Pacific Coast Office,
SAN FRANCISCO

The LATEST ADDITION to the MOTOR FLEET

Standard Oil Company's
M. S. H. T. Harper equipped
with twin 1100-1. H. P.
"PACIFIC WERKSPOR" Diesel Engines.

Deadweight - - 5010 tons
Speed - - - 12 knots
Fuel Consumption - -
- 54 barrels per 24 hours
Fuel Oil - - - 14° Baume

This is the second of the
Standard Oil Company's
fleet of WERKSPOR
propelled motor ships



Showing standard marine construction
of WERKSPOR DIESEL ENGINES
"Note Accessibility"



M. S. H. T. Harper
"On trial trip" Oct. 27, 1921

PACIFIC DIESEL ENGINE CO.

OAKLAND, CALIFORNIA



LOS ANGELES SHIPBUILDING & DRY DOCK CO.

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Designers and Builders of all types of Steel Ships, Marine Engines, Boilers, Auxiliaries and Equipment. Unlimited Repair Facilities for Steel and Wood Vessels, their Machinery and Equipment. 12,000-Ton Floating Dry-Dock. Building Slips and Fitting Wharves. Two 100-Ton Shear Legs. Ocean and Harbor Tugs. Fully Equipped Shops.

A Ship Construction, Dry Dock and Repair Plant, complete in every detail, maintained for service to the Navy and Merchant Marine at Los Angeles Harbor, San Pedro, Cal.

*West Lewark.
Five of this type
of 11,500-Ton
Flush Deck
Steel Freighters
were built for the
U. S. Shipping
Board Emergency
Fleet Corporation*

The increasing use of superheat in the marine field



Foster Superheater installed in upper of Scotch boiler.



Foster Superheater installed in tube bank of Foster marine water-tube boiler.

The cost of marine fuel has increased in the last few years to a point where it is receiving considerable attention. To improve the fuel economy of marine propelling equipment, water-tube boilers, turbines, and high vacuum equipment have been installed on many ships, and over one thousand ships have been fitted with superheaters.

The fuel consumption of an existing installation can be reduced at less expense by adding superheaters than by any other method, and the fuel saving effected by Foster Superheaters is greater than obtained from high priced, high grade equipment of other types. In many cases the cost of Foster Superheaters has been saved in from two to three years' operation. This is particularly true in the case of Scotch marine boilers where the superheat can be obtained from the waste gases without any additional fuel being burned.

In a very recent case a large tow boat company checked the performance of two duplicate tugs, one with and the other without Foster waste heat type superheaters. The fuel saving of 20% is paying for the superheaters in less than two years.

In many Scotch boilers the steam space is small and when the boilers are salted severe priming occurs causing rapid wearing of turbine blades or short life of engine piston rings. Foster waste heat superheaters entirely eliminate this trouble and save considerable in turbine or engine repairs. This also prevents delays in the ships' operation, which results in a very attractive additional saving.

Superheat has become standard in land plants and at the present rate of progress will be standard in marine plants in the next few years. If America is to keep her place on the seas her ships must follow the proven economy of her land plants. The American stationary plants are admitted the peer of all others and the American marine plant will unquestionably win the same prestige when advantage is taken of known successful fuel saving methods.

Send for the Foster Superheater Book 54

POWER SPECIALTY COMPANY

GENERAL OFFICES: 111 Broadway, New York

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New Orleans, Marine Supply Company
WORKS: Dansville, N. Y., and Egham, England

FOSTER SUPERHEATERS

Leschen Wire Rope

Every Leschen Wire Rope has back of it over 60 years of manufacturing experience.



Tell us how you use wire rope and we shall be glad to recommend the right rope for the work.



For heavy hoisting we recommend Hercules (Red - Strand) Wire Rope, because of its great strength and durability.



Established 1857

A. LESCHEN & SONS ROPE CO.

ST. LOUIS, MO.

New York Chicago Denver San Francisco

1928

MOTT

1921

Every year sees higher standards in the plumbing demanded for ships that carry the American flag. Naturally, they turn for equipment to the company that has developed and maintained these high standards for so many years.



The "American Legion," recently built for the Munson Line by the New York Shipbuilding Corporation, is equipped throughout with Mott Plumbing.

A tiled bathroom of exceptional beauty in the "American Legion," the latest addition to the Munson Line.

Mott Marine Plumbing exemplifies in practical form the latest developments demanded in marine architecture. It has an unequalled reputation for service in every type of craft, from motor boat to ocean liner. Send for a copy of our latest "Marine Plumbing" catalog.

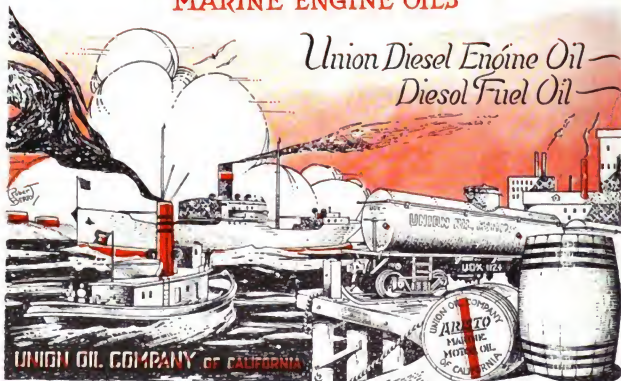
THE J. L. MOTT IRON WORKS

GENERAL OFFICES AND PLANT
TRENTON, N. J.

Fifth Avenue and Seventeenth Street, New York
Philadelphia, Washington, Boston, Chicago, Seattle
and all principal cities.

AETNA-OLEUM-TRITON

MARINE ENGINE OILS



*Union Diesel Engine Oil —
Diesel Fuel Oil —*

UNION OIL COMPANY OF CALIFORNIA

Throw on the ADVERTISING POWER



Throw On The Power!



IT IS TRUE, that the outlook is exceedingly bright for business during 1922 from the important industries of ship operating, ship repairing and maintenance.

It is true that millions of dollars will be spent by this tremendous purchasing power.

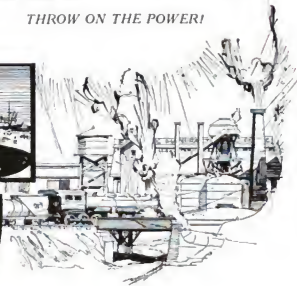
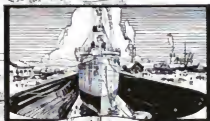
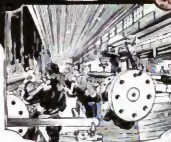
But it is likewise true that the manufacturers of marine machinery, auxiliaries, equipment and supplies who are dependent on this market will meet vigorous competition.

1922 will be a prosperous year for aggressive manufacturers.

It will be hopelessly dull for quitters.

The time has come for redoubling sales and advertising campaigns.

THROW ON THE POWER!





LUNKENHEIMER

"Victor" Gate Valves



Fig. 941
Iron Body Bronze Mounted
For pressures up to 125 lbs.

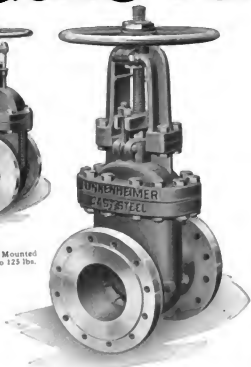


Fig. 1353, Cast Steel
For pressures up to 350 lbs.



Fig. 787, Bronze.
For pressures up to 250 lbs.

Dependable performance is the service record of LUNKENHEIMER "VICTOR" GATE VALVES. The Lunkenheimer solid wedge disc, double-faced and guided in its travel, is the most practical design of Gate Valve construction. It eliminates "dragging" across the seating faces and the consequent wear prevalent in valves employing loose parts.

Highest quality materials, coupled with the Lunkenheimer method of manufacture: bearings bushed to minimize wear; all parts including the seatings renewable, and the indestructible gasket between the bonnet and body flanges, all tend to enhance their value and insure longevity.

Lunkenheimer "VICTOR" Gate Valves are made in Bronze for pressures up to 125 and 250 pounds; in Iron Body Bronze mounted for pressures up to 100, 125, 175 and 250 pounds, and in Cast Steel for pressures up to 350 pounds and temperature to 800° F. A complete line covering every service requirement.

LUNKENHEIMER Distributors situated in practically every port carry LUNKENHEIMER PRODUCTS in stock for immediate delivery. Specify LUNKENHEIMER and insist on getting what you specify.

THE LUNKENHEIMER CO. —"QUALITY"—

LARGEST MANUFACTURERS OF
HIGH GRADE ENGINEERING SPECIALTIES
IN THE WORLD
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OF CATALOG BEARS
NY 55
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6 23M-53



Picture opposite illustrates Windlass Gearing for U. S. S. Tennessee. Worm wheels 7' 4½" in diameter made from Cramp's Super-Strength Gear Bronze. The worm is 12.411" in diameter of Carbon Steel.

Meeting the Demand for a Better Gear Bronze

Not only does Cramp's Super-Strength Gear Bronze fill every requirement in the production of gears, but more than that, it has created a new standard for this type of metal.

After 90 years experience in the manufacture of all kinds of machinery, we have learned the secret of producing a bronze which engineers can specify with entire confidence when planning gears which must be wholly reliable.

Tests of the worm wheels shown above, conducted by the Bureau of Construction and Repair, showed the following:

	Strain per square inch in lbs.	Limit of ELASTICITY per square inch in lbs.	Elongation per cent of original length	Reduction per cent of original section
Gear "A"	117500	63500	20.0	27.5
Gear "B"	98500	69000	19.0	18.0
Gear "C"	104500	70000	23.0	22.0

THE WILLIAM CRAMP & SONS
SHIP & ENGINE BUILDING COMPANY
 Philadelphia, Pa.

Specialists in
 Foundry Products—
 Iron, Steel and
 Bronze



This bronze can be furnished in the form of forged or cast blanks or gear wheels machined and hobbed complete, including the furnishing of steel worms—ready for installation.

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The Only Self-Contained Plant in the West



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Marine Boilers
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Tail Shafts
Cargo Winches
Anchor Hoists
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Horizontal Return
Tubular Boilers
Vertical Tubular
Boilers
Water Tube
Boilers

Feedwater
Heaters
Steel Smoke
Stacks
Water Tanks
Steel Tanks and
Towers

Hemispherical
Bottom Tanks
and Towers
Standpipes
Pressure Tanks
Ships' Tanks
Steel Water Pipe

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Pipe
Penstocks
Riveted Steel
Pipe
Steel Bridges
Steel Buildings

Steel Office
Buildings
Steel Mill
Buildings
Steel Warehouses
Steel Towers of
all kinds
Steel Towers for
Wireless
Stations
Steel Towers
and Tanks
Steel Lift
Bridges
Rock Crushers
Stamp Mills
Hammered Steel
Shoes and Dies
Cast Steel Shoes
and Dies
Cast Steel Sleeve
Dies
Electric Mine
Hoists
Steam Mine
Hoists
Locomotive
Cranes
Rolls
Pulp Presses
Molasses Tanks
Electric Pass-
enger Elevators
Electric Freight
Elevators



Machining a built-up crank shaft for a 2800 h. p. engine in the Llewellyn shops, the only self-contained plant in the West. The webs are cast at the Llewellyn steel foundry, the bearings and pins are forged from Llewellyn steel ingots.

Steam Hoists
Locomotive
Cranes—
Electric
Locomotive
Cranes—Steam
Traveling Cranes
—Electric
Traveling Cranes
—Hand
Jib Cranes
Steel Stiffleg
Derricks
Steel Guy
Derricks
Heavy and Light
Forgings
Heat Exchangers
Condensers
Storage Tanks
Gas Holders
Chilled Rolls
Steam Engines,
Corliss
Hydraulic Pass-
enger Elevators
Hydraulic Freight
Elevators
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STEEL SHAPES

FLAT
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ANGLES
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I BEAMS

TORRANCE, CALIFORNIA

STEEL BARS—FOR CONCRETE

RIVET STEEL
STAYBOLT STEEL
FORGING INGOTS
GRAY IRON CASTINGS

STEEL BILLETS
STEEL INGOTS
STEEL CASTINGS

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M E S T A



VIEW IN SHIP SHAFT ASSEMBLING DEPARTMENT

SUPERIOR QUALITY

SHIP SHAFTING

THRUST SHAFTS LINE SHAFTS PROPELLER SHAFTS

PRESS forged from Acid Open Hearth Steel Octagonal Fluted Hot Top Ingots and properly Heat treated; furnished either rough turned or finished complete.

We make a specialty of complete sets of Ship Shafting including Thrust Blocks Line Shaft Bearings and Stern Tubes, finished complete and assembled ready for installation without any further work being necessary at the Ship Yard.

Mesta finished Ship Shafting accurately finished and aligned is especially adapted for turbine driven ships.

MESTA MACHINE COMPANY

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(MAIL ADDRESS, BOX 1124, PITTSBURGH)

Manufacturers of

Gas and Steam Power Engines, Blowing Engines, Rolling Mill Machinery, Forging Presses, Gear and Rope Drives, Barometric Condenser and Vacuum Pumps, Air Compressors, Pickling Machines, Cut and Machine Molded Gears and Rolling Mill Pinions, Iron and Steel Castings, Rolls, Forgings, Forging Ingots, Forging Billets, etc.

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ers of Wood &
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Dry Docks**

**1000 to 12000
TONS**

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Brooklyn

Canton Insurance Office

(Limited)

OF HONGKONG, CHINA

Capital Subscribed	\$1,250,000.00
Capital Paid Up	500,000.00
Cash Assets	4,334,694.00
Net Surplus	2,822,563.44

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Marine Insurance Business

PARROTT & CO., General Agents

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COLMAN BLDG. SEATTLE, WASH.

MARINE INSURANCE

THE

**IMPORTERS & EXPORTERS
INSURANCE COMPANY**

of

New York

INSURES

**Hulls, Cargoes, Freights and
Disbursements**

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E. L. BARRY, Manager

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CRANE'S SHIPYARD AND DRYDOCKS

Erie Basin, Breakwater Gap,
BROOKLYN, N. Y.

TURBINE, RECIPROCATING ENGINE,
BOILER AND HULL REPAIRS

CAPACITY OF DRYDOCKS

No. 1	. .	2,500 Gross Tons	. .	250 Feet
No. 2	. .	5,500 " "	. .	380 "
No. 3	. .	900 " "	. .	200 "
No. 4	. .	11,000 " "	. .	500 "

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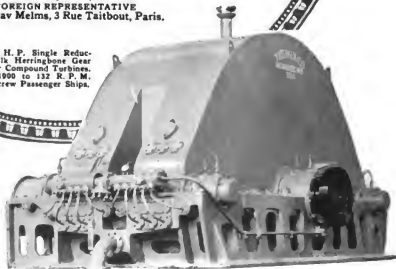
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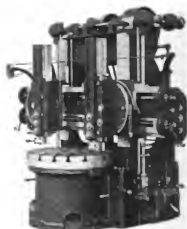
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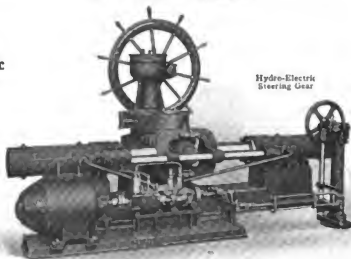
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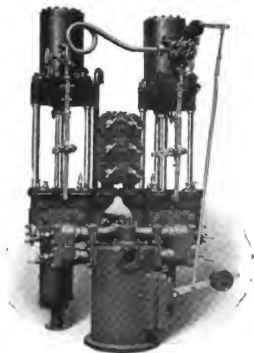
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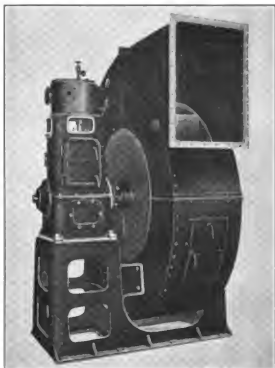
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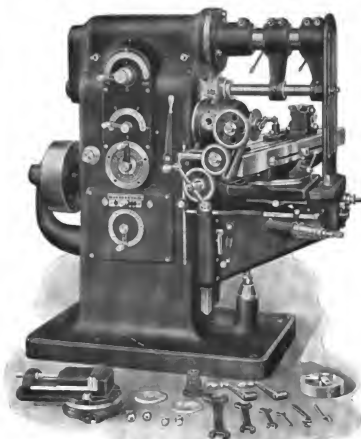
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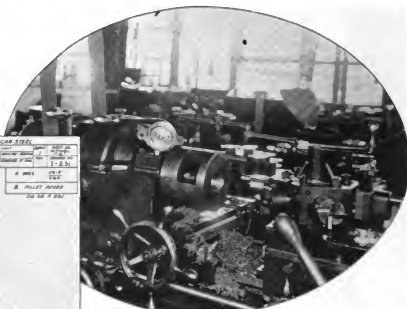
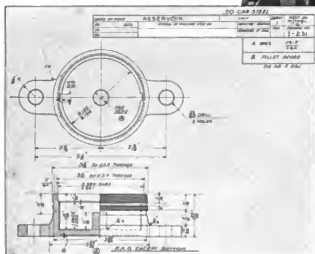
MILHOLLAND

Turret Lathes

The photograph of this Milholland set-up was taken through the courtesy of the Houde Engineering Co., Buffalo, N.Y.

It shows the finishing operations on the reservoirs of hydraulic shock absorbers.

Note how close the limits are held.



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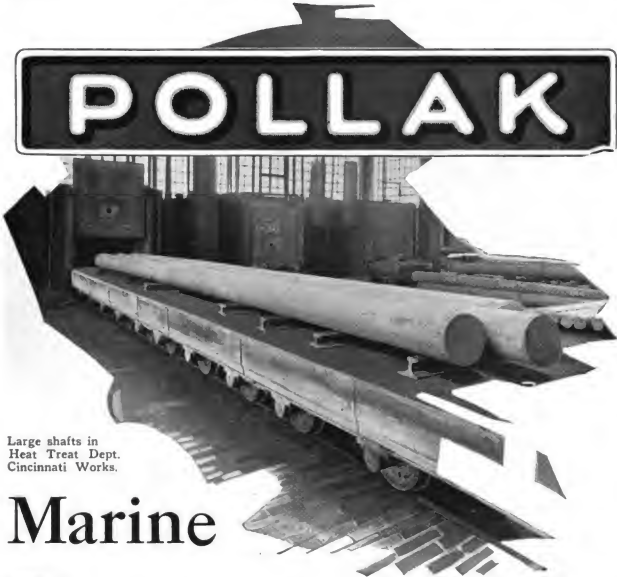
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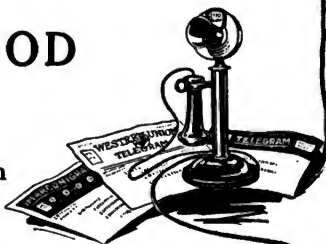
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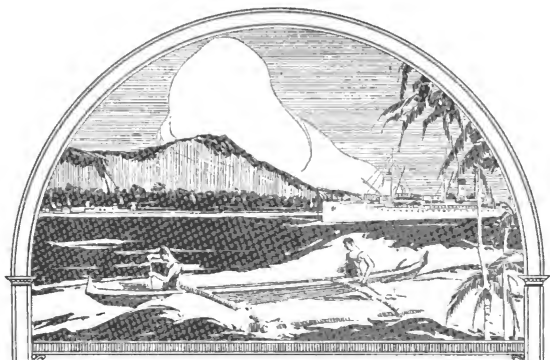
UNITED ENGINEERING & FOUNDRY CO PITTSBURGH, PA.

The World's Greatest
Manufacturers



of Rolls and Rolling
Mill Machinery.

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Midwinter in Hawaii is A Vision of Paradise

Instead of cold, snow and darkness, you will find in Honolulu warmth and sunshine, azure blue ocean inviting you to swim, grass-covered hills beckoning, and flowers everywhere. How would you like to bask for hours on a sun-flooded beach during the winter months, or stay in wondrous clear ocean water half a day without feeling cold?

You Can Do It in Honolulu

The average Midwinter temperature in the
Hawaiian Islands is 70°

MATSON NAVIGATION CO.

General Offices San Francisco
Baltimore - Seattle - Los Angeles
and

Honolulu - Hilo - Kahului - Port Allen T. H.



America's Most Powerful High-Speed Gears

The De Laval double-helical speed-reducing gears shown herewith are the most powerful ever built in this country for high-speed turbine service. They are driven by compound turbines and transmit 22,500 hp. at a propeller speed of 360 r. p. m.

Such gears have been made possible and successful only by the De Laval policy of liberal design and precision in manufacture, combined with 25 years of turbine and gear experience.

Over 2,000,000 of De Laval marine gears are now in service. Many of them have traveled over 200,000 miles, and are giving perfect satisfaction. De Laval gears are unique in this respect.

De Laval reduction gears are exceedingly quiet in operation and are highly efficient as demonstrated by their record in service. Noisy reduction gears greatly reduce the efficiency and morale of engine room crews who depend upon their hearing more than upon any other sense to locate trouble.

Ask for our special marine catalog M 57

De Laval

STEAM TURBINE CO.
Trenton, N. J.

166



THE MORSE DRY DOCK & REPAIR CO., BROOKLYN, N. Y.

The Large Ship Repair Yard Can Do Your Work at Less Cost, —and Why?

PRODUCTION costs are generally lower in the larger yard. The Morse Company has machinery and equipment which is capable of cutting the time and cost of your job to the lowest possible degree; equipment which is not available in the smaller plant.

Proper distribution of overhead expense and unusual facilities make our cost per unit of work cheaper.

This is the time when you should expect economical and efficient ship repair work and in Morse Service you get it.

MORSE DRY DOCK & REPAIR CO.

Tel.: Sunset 5100 BROOKLYN, N. Y. Cable: Pyrosison, N. Y.

WHEN YOU BUY **A-E-CO. AUXILIARIES**

you get more than a piece of machinery;
more than so many pounds of metal;
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Steering Gear
Telemotors
Windlasses
Winches
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covering sixty years of designing and building marine auxiliaries, culminating in a definite knowledge of what to build and how to build it.

You Get Service

of a character that has no superior. A service that is constantly competing with itself.

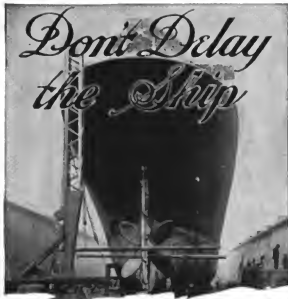
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You Get Satisfaction

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Kearfott Service And What It Means

KEARFOTT SERVICE means prompt delivery of many forms of marine equipment from stock—it means prompt assistance in emergency cases—it means, by virtue of Kearfott's closer buying and manufacturing connections, lower prices to you—and with it all goes the expert advice of practical marine engineers—based on their many years of experience in this field.

Quick shipments of

- Main units and auxiliaries**
- condenser tubes and ferrules**
- brass and copper pipes**
- boiler tubes (charcoal iron, seamless or lap-welded)**

When you are ready to buy marine mechanical equipment it will pay you to get in touch with our agents.

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McKINLAY ENGINEERING BUREAU
Chamber of Commerce Bldg., Portland, Ore.

K-58

What are the advantages of the Ward Watertube Boiler?



A fair question easily answered—

Low first cost	Evaporates 17 lbs. of water to
Low installation cost	to 1 lb. of oil
Low upkeep cost	Straight seamless tubing only
Positive circulation	No nipple connections
Rapid evaporation	No stay bolts

These are the reasons why Ward Boilers are in use today on many ships of the U. S. Navy, the U. S. Shipping Board and many commercial lines.

Would you like us to tell you full particulars about the Ward Boiler? Write now.

THE CHARLES WARD ENG'G. WORKS
Charleston, W. Va.

Eastern Agent
Kearfott Engineering Co., Inc.
95 Liberty St., New York, N. Y.

BUY IT FROM THE NAVY

Naval Vessels as Hulks for Salvage

By Sealed Proposals opening January 16, 1922

At Board of Survey, Appraisal and Sale,
Navy Yard, Washington, D. C.

Improvements in Naval construction have rendered these fine old warships obsolete, and the opportunity is now being given the metal trades to purchase for salvage the following vessels:—

Some of the Vessels Offered for Salvage

(Note.—Displacement given below is for full load)

- U. S. S. MAINE (Battleship).** Built in 1901.
Length, 393 feet; draft, 23 feet; beam, 72 feet.
Displacement, 13,500 tons. Now at Philadelphia, Pa.
- U. S. S. MISSOURI (Battleship).** Built in 1901.
Length, 394 feet; draft, 24 feet; beam, 72 feet.
Displacement, 13,500 tons. Now at Philadelphia, Pa.
- U. S. S. WISCONSIN (Battleship).** Built in 1898.
Length, 374 feet; draft, 24 feet; beam, 72 feet.
Displacement, 12,150 tons. Now at Philadelphia, Pa.
- *U. S. S. BROOKLYN (Cruiser).** Built in 1895.
Length, 402 feet; breadth, 65 feet; draft, 24 feet.
Displacement, 10,968 tons. Now at Mare Island, Calif.
- *U. S. S. COLUMBIA (Cruiser).** Built in 1892.
Length, 413 feet; draft, 23 feet; beam, 58 feet.
Displacement, 7,187 tons. Now at Philadelphia, Pa.
- U. S. S. MEMPHIS (Cruiser).** Built in 1903.
Length, 504 feet; draft, 25 feet; beam, 73 feet.
Displacement, 15,732 tons.
Now a wreck at Santo Domingo, D. R.
- TARGET (Ex-Monitor PURITAN).** Built in 1882.
Length, 299 feet; draft, 18 feet; beam, 60 feet.
Displacement, 6,000 tons. Now at Norfolk, Va.
- U. S. S. OZARK (Monitor).** Built in 1900.
Length, 255 feet; draft, 13 feet; beam, 50 feet.
Displacement, 3,356 tons. Now at Philadelphia, Pa.
- TARGET (Ex-Monitor MIANTANOMOH).** Built in 1876.
Length, 263 feet; draft, 14 feet; beam, 55 feet.
Displacement, 3,990 tons. Now at Norfolk, Va.
- U. S. S. TONOPAH (Monitor).** Built in 1900.
Length, 155 feet; draft, 13 feet; beam, 50 feet.
Displacement, 3,356 tons. Now at Philadelphia, Pa.
- *U. S. S. SMITH (Destroyer).** Built in 1909.
Length, 104 feet; draft, 8 feet; beam, 20 feet.
Displacement, 902 tons. Now at Philadelphia, Pa.
- *U. S. S. ALBERT BROWN (Fish Boat).** Built in 1897.
Length, 103 feet; draft, 10 feet; beam, 18 feet.
Gross tonnage, 108 tons. Now at Philadelphia, Pa.
- U. S. S. ORIOLE (Ex-DALE); Wooden Sailing Vessel.** Built in 1839.
Length, 117 feet; beam, 34 feet.
Now at Coast Guard Depot (S. Baltimore, Md.).

NOTE—The vessels marked with an asterisk (*) will on December 15, 1921, be offered for sale for "Conversion to Commercial Uses." Such vessels as are not sold on that date will be offered on January 16, 1922, for sale as "Hulks for Salvage."

The offer of these vessels by the Navy Department for sale to commercial organizations should be considered from the standpoint of a nucleus to go into the ship breaking up field for some "farsighted concern" looking for new business.

Aside from the ferrous and non-ferrous metals entering into Naval ship construction, consider the electrical machinery, pumps, winches, boilers, engines, piping, etc., for which there is always a receptive market with an attractive recovery.

A careful investigation of the success recently achieved in foreign countries by "ship breaking" concerns will convince you of the advisability of promptly communicating with the Navy Department.

Write or wire for catalog No. 17-40b giving the terms of sale and describing the vessels offered

Central Sales Office

NAVY DEPARTMENT

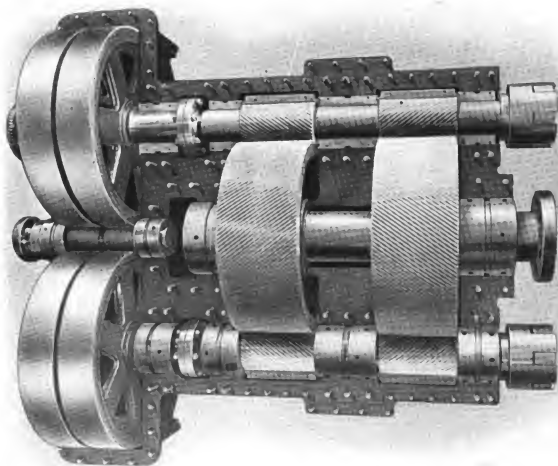
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100% ACTUAL PERFORMANCE

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**Manufacturers of Geared Turbine Propelling Machinery in capacities up to 6000 S.H.P.
Also Turbine Driven Auxiliaries, all sizes.**

KERR TURBINE COMPANY
WELLSVILLE **NEW YORK**

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This red, white and blue *Tape-Marker*

—positively identifies and guarantees the strength, durability and service of every foot of Columbian *Tape-Marked* Pure Manila Rope—a modern product, made with modern machinery and methods in the most up to date Cordage plant in the country

From the time that Columbian representatives select the fibre in the Philippines until the completed rope is coiled and ready to ship, frequent and rigid inspections are made during the various stages of manufacture. The result is a high grade rope that we are glad to back up with an absolute guarantee.

Buy Columbian Red, White and Blue *Tape-Marked* Rope.



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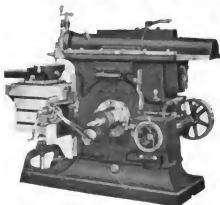
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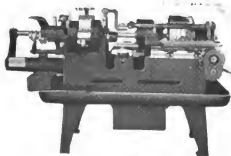
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Crank Shapers
are recognized leaders in their field



Crank sizes: 12", 14", 20", 25". Either Cone Drive or through Speed Box, with or without Motor Drive arrangement. Also 28" and 28/32" Back Geared All Geared.

CLEVELAND
Automatic Chucking, Screw and
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Cleveland 2-Inch Model B

Incomparable Range
If you are a good judge of a day's work
Investigate the Cleveland

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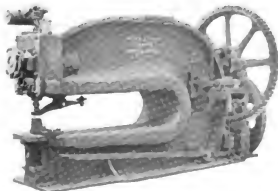
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Punches, Shears, Bending Rolls



A reliable Punching Machine with 72" throat, fitted with floating punch attachment and clutch engaged by electric solenoid mechanism operated by push button. Increases production. Built with 12" up to 72" throats and capacity to suit your work.

**INGERSOLL
MILLING MACHINES**
The result of thirty-five years' experience



We shall be glad to go over your work with you and without obligation submit sketches and estimates of the results you can obtain from Ingersoll Equipment in your shop.

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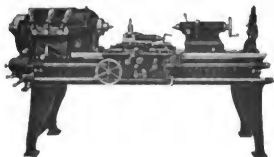
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"More Lathe Work With Fewer Lathes"

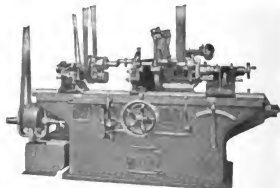


Cover practically all requirements of the Manufacturing Plant, Jobbing Shop, Tool Room and for all purposes requiring accurate lathe work.

Cone Head Sizes 14 to 36-inch Light Type
Selective Head (all Geared Types). 14 inch to 60 inch

LANDIS GRINDERS

83 Sold in California in 1920



No. 4-A Special

Grinds Pistons, Piston Pins, Piston Rings, Valves, Stems, Push Rods, Crank Shafts of ANY Pleasure Car or Truck.

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CINCINNATI MILLERS

Plain, Universal, Vertical
"The Latest in Milling Machine Design"

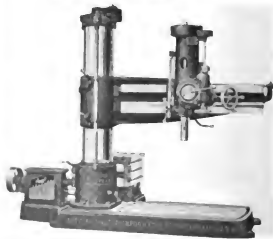


No. 5 UNIVERSAL HIGH-POWER MILLER

Cincinnati Millers are built in the largest factory in the world devoted exclusively to the manufacture of Milling Machines.

CINCINNATI BICKFORD

Upright and Radial Drills
"Mean More Profit in Holes"



Cincinnati Bickford Upright and Radial Drills have profitably served the largest concerns in the country for nearly half a century.

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Do You Realize the Possibilities of

BAKER DRILLS

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FORMING
COUNTER BORING



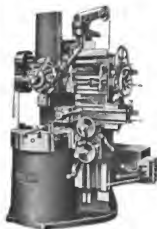
No. 314
3-inch capacity
Other sizes $\frac{3}{8}$ " to
5" capacity

They are tremendous
and worthy of your
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Will Give You Improved Quality of Product

BULLARD VERTICAL TURRET LATHES

MORE
PRODUCTION
PER MINUTE
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MINUTES
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The Last Word in Power Hammer Design
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MAYER POWER HAMMERS

Result of thirty years'
experience in Hammer
Building

Sizes—25, 50, 100, 250
and 500 pounds



BELTED OR MOTOR DRIVEN

Hundreds of Sizes and Styles

FERRACUTE PRESSES

For

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Pipe threading expense reduced 60% on Cunard Building job

TO save the delay and expense of sending pipe out to be threaded, the W. G. Cornell Company, plumbing contractors for the new Cunard Building, decided to install a couple of pipe threading machines right on the job.

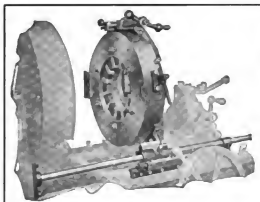
Two Williams 8" pipe threading machines, with the patent receding die-head, were selected. They were installed in July 1920 and remained until February 1921. During that time, they thread and cut 75% of all the pipe used in the big Cunard Building, all the plumbing pipe for a second building and 50% of the pipe for a third building—all Cornell contracts.

These two Williams machines worked all day every day, except holidays—six months straight before even regrinding chasers.

In dollars and cents talk, W. G. Cornell Company estimate this Williams installation reduced pipe threading and cutting expense at least 60%. This represented a saving sufficient to several times cover the cost of the two machines.

Williams Tool Corporation

Canadian plant: Brantford, Ontario
Erie Penna.
HARRON, RICKARD & McCONE, Inc.
San Francisco, Los Angeles



An exclusive new feature

The Williams patent receding die-head is the only head which cuts any degree of taper any desired length. Write for complete information.



Williams Pipe Threading Machines

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Go into any large machine shop in the country

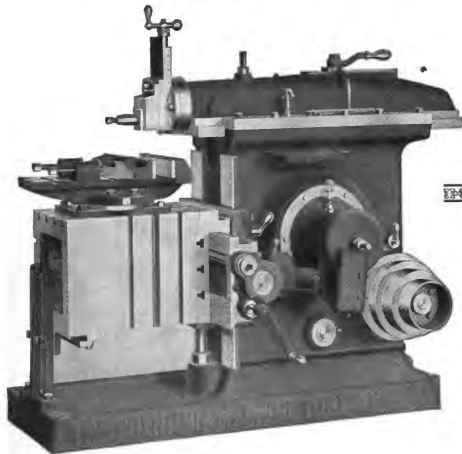


You will find that many of the machine tools in use carry, in addition to the name of the manufacturer, a small silver plate like the one shown.

It is a symbol of service performed, not alone the purely commercial one of the sale of a piece of machinery, but in the way of recommendation and advice in the choice of equipment to meet the peculiar manufacturing conditions of the shop.

This is the service of the Company's Staff of Advisory Engineers—You may care to take advantage of it—if so, write to

**Machinery
Headquarters**



Columbia Shaper

A powerful, well balanced machine with a wide range of application.

Equipped with eight speeds—lead changes easily made while machine is in operation. Powerful gearing that makes for smooth, easy operation and many operating conveniences that make for rapid and economical production.

Sizes 16, 20, 24, 26 and 32 inch. Cone Drive—Single Pulley Drive—Motor Drive. Ask for illustrated bulletin.

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CRANES-MACHINE TOOLS-SUPPLIES-VALVES-INJECTORS-INSPIRATORS-SAFETY VALVES-GAUGES

M-9

Electric!

The First Electrically Driven Ferry

Diesel Electric Drive doubles vehicle capacity, reduces fuel consumption one-half, and eliminates standby losses and smoke. Maneuvering is facilitated and the entire control of the boat is in the hands of the pilot.

**Westinghouse
Electric & Mfg. Co.**

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Offices in all principal cities

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*Special Pacific Coast
Representative*



The Highland-Poughkeepsie Ferry

Westinghouse Electric Propulsion
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AIRCO OXYGEN AND ACETYLENE SERVICE

IS GOOD SERVICE

No Shortage on the Big Jobs

Large welding and cutting operations often necessitate emergency orders for Airco Oxygen and Airco Acetylene.

You need not fear a shortage of supply when undertaking these large projects, because a nearby Airco Distributing Station is prepared to handle efficiently your rush orders for Airco Oxygen and Airco Acetylene.

"Airco Oxygen and Acetylene Service is Good Service" under all conditions.

AIR REDUCTION SALES COMPANY

*Manufacturers of Airco Oxygen, Airco Acetylene
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342 MADISON AVE.,
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Airco Plants and District Offices:

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Airco warehouses at intermediate points

Bold type indicates the city also contains an Airco District Office. Address correspondence to nearest District Office.

Airco was used to a large extent in rebuilding this steamship which was shortened to admit of passage from the Great Lakes to an important eastern dry dock.

AIRCO
OXYGEN



Introducing Oxy and Hy, welders and cutters.

They claim that the most important thing for a man in their profession to have is "brains."

The real brainy welder and cutter finds out "how" and then investigates "why." Among other things he knows that the oxygen in the cylinders he is using should test 99% pure or better and when he is cutting he prefers hydrogen.

GAS PRODUCTS ASSOCIATION

801 Marquette Bldg.,

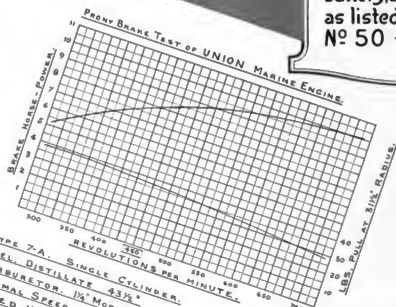
CHICAGO, ILL.

1921 TYPE

UNION MARINE ENGINE

MANUFACTURED BY
UNION GAS ENGINE CO.
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B.H.P. - - - 8.37
Rated H.P. - - - 7
Propeller 24" diam.
Extra long bearings
Extra large valves
Simple Igniter - -
Large water pump
having capacity 125
gals. per hour - -
PRICE \$560
- F.O.B. OAKLAND -
Including magneto,
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TYPE 7-A. SINGLE CYLINDER.
FUEL, DISTILLATE 43 1/2"
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NORMAL SPEED 450 R.P.M.
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STANDARD SIZE PROPELLER 24" DIA.

M.E.P. 26
I.H.P. 8.37



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This Company is in a position to offer to the Shipping interests world-wide facilities for bunkering with "Standard" Fuel Oil. This service makes possible the decided economies resulting from the use of "Standard" Fuel Oil.

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*Astoria *Honolulu
*Richmond

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MEXICO

Tampico

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Arrangements will shortly be completed to cover ports in addition to those listed, as follows:

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Fort William, Ont.
Hamilton, Ont.
Sarnia, Ont.
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Antilla, Cuba
Matanzas, Cuba
Antofagasta, Chile
Iquique, Chile

Piaggua, Chile
Tocopilla, Chile
Talca, Chile
Paita, Peru
Callao, Peru
Bahia Blanca, Arg.
Punta Delgada, Azores
Trondhjem, Norway
Bergen, Norway
Christiania, Norway
Valin, Norway

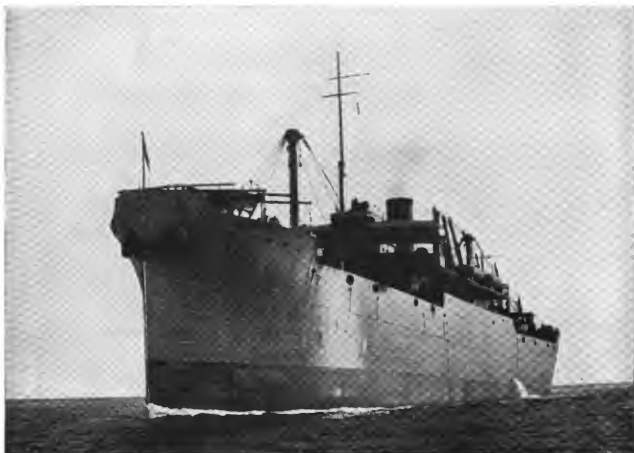
Göteborg, Sweden
Helsingfors, Finland
Aalborg, Denmark
Copenhagen, Denmark
Nyborg, Denmark
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Birkenhead, U. K.
Cardiff, U. K.
Rotterdam, Holland
Amsterdam, Holland
Antwerp, Belgium

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Marseilles, France
Dunkirk, France
La Pallice, France
Genoa, Italy
Monopoli, Italy
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Salonica, Greece
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Alexandria, Egypt
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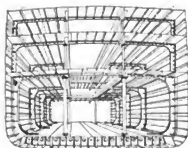
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26 Broadway, New York



Well-known 8800-tonner built on the Isherwood System

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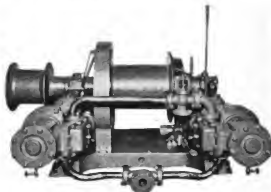
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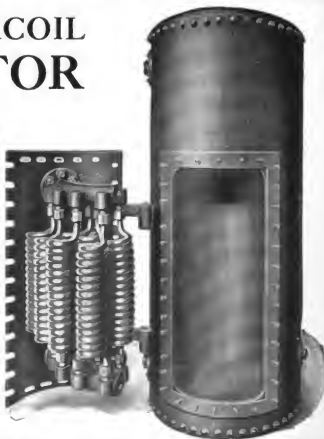
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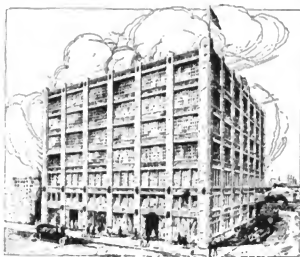
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Total Assets, \$40,872,541.70

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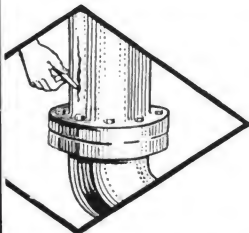
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THE FOSTER BOILER

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The interior of a furnace fitted with a fire-brick and clay bridge wall, showing the effects of 4000 miles of steaming. Note the loss of grate surface by clinkers adhering to bridge wall

Wager Furnace Bridge Wall

Sent upon
request.



Interior of same furnace fitted with the Wager patent bridge wall, taken after the vessel had steamed for 40,000 miles. Note the absence of clinker and condition of grate bars and bridge wall

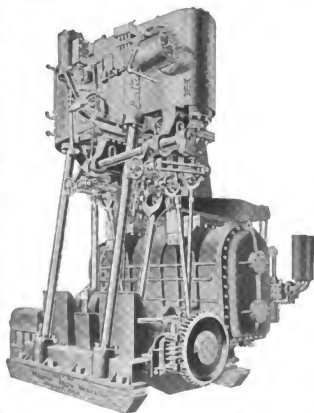
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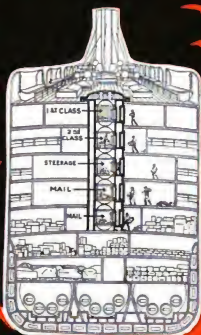
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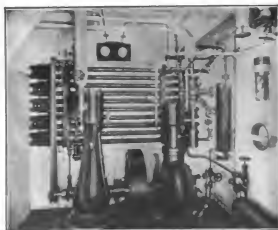
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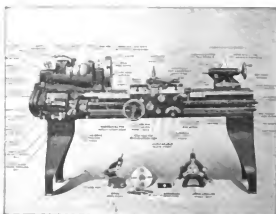
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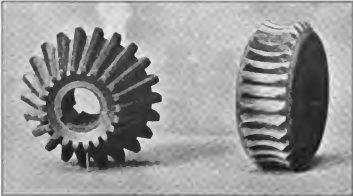
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ALL LENGTHS
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Plymouth, Cherbourg and Bremen—From New York
January 3—America (159)
December 8, January 17—George Washington (159)

SOUTH AMERICA

**Rio de Janeiro, Montevideo and Buenos Aires
From New York**
December 8—Aeolus (91).
December 22—Huron (91).

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**Honolulu, Yokohama, Kobe, Shanghai, Manila,
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Dec. 17, March 4, May 13—Hoosier State (105)
January 7, March 25—Golden State (106)
February 7, April 19—Empire State (105)
**Yokohama, Kobe, Shanghai, Hongkong, Manila
From Seattle**
December 10—Pine Tree State (106).

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Calcutta—From San Francisco**
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310

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like this, P & W
Staybolt Taps show
their quality. They bite
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precision and ease that
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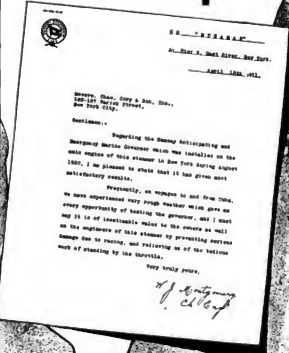
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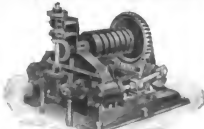
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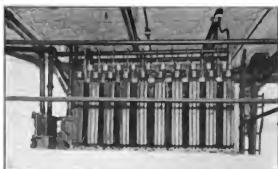
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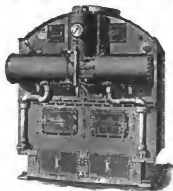
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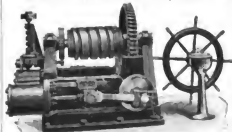
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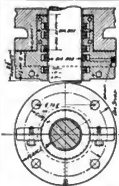
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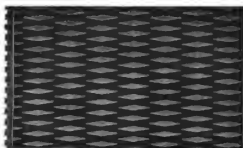
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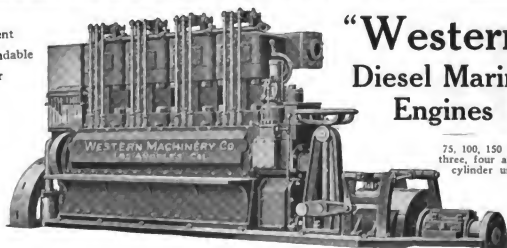
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Seattle Chain Company.

Coolers.

Alvager Pump & Condenser Co.

Griscom-Russell Co.

Ross Heater & Mfg. Company.

Schutte & Koerting Company.

Coppersmithing.

C. W. Smith Copper & Brass Co.

Copper Fittings.

Bridgeport Brass Company.

C. W. Smith Copper & Brass Co.

The Chase Co. of Cal., Inc.

(See Rope.)

Corrugated Marine Boiler Furnaces.

American Solid Pipe Works.

Counters (Revolution, for Engines, Pumps, Etc.).

American Steam Gauge & Valve Manufacturing Company.

Cowls.

(See Ventilator Cowls.)

Cranes.

(See Chain Hoists, Blocks & Cranes.)

Harron, Rickard & McCone.

Niles-Bement-Pond Company.

Stamp Electric Hoist Co.

Craner and Hoists, Electric.

Allen Cunningham Co., Inc.

Berger & Carter Company.

Champion Engineering Company.

S. Flory Mfg. Company.

Harron, Rickard & McCone Co.

Herberts Machinery & Supply Co.

Louis G. Hene.

Lewisley Iron Works.

Marlowe Decking & Supply Co.

Drawing & Harnischfeger Co.

Shaw Electric Crane Company.

Shepard Electric Crane & Hoist Company.

Stamp Electric Hoist Co.

The Pollak Steel Company.

Crank Shafts.

(See Fergings.)

Cutter (Angular, Involute Gear).

Berger & Carter Company.

Harron, Rickard & McCone Co.

Louis G. Hene.

Cutters (Milling Spiral, Special).

Berger & Carter Company.

Harron, Rickard & McCone Co.

Louis G. Hene.

Cutting and Welding.

(See Welding and Cutting.)

Cylinders, Hydrogen, Oxygen, Nitrogen.

International Oxygen Co.

Devis.

American Bala Co., Inc., Wein

Marlowe Equipment Dept.

Lewisley Iron Works.

Steward Davit & Equipment Co.

Davis (Mechanical, Oil Hose, Submarine Bell).

Steward Davit & Equipment Corp.

Derricks.

Lewisley Iron Works.

Fawcett & Harnischfeger Co.

Detaching Gear (Boat).

Steward Davit & Equipment Corp.

Die Blocks (for Drop Forging).

American Steel Foundries.

Crane.

Dies (Compression Riveter).

Geo. F. Marchant Company.

Louis G. Hene.

Stamp Electric Hoist Co.

Electric Fittings and Supplies.

Chas. Cory & Son, Inc.

Cutler-Hammer Mfg. Co.

Electric Hoist and Elect. Co.

Engberg's Electric & Mechanical Works.

Griscom-Russell Company.

Westhouse Electric & Mfg. Company.

Electric Furnace Steels.

Lewisley Iron Works.

Electric Log.

The Sperry Gyroscope Co.

Electric Plants.

Chas. W. Dahl & Son Elect. Co.

Engberg's Electric & Mechanical Works.

Fairbanks, Morse & Company.

Port Turbine Company.

Westhouse Electric & Mfg. Company.

Electric Welding.

Morse Drydock & Repair Co.

Electric Welding Outfits.

Berger & Carter Company.

Westhouse Electric & Mfg. Company.

Electrical Wiring Devices.

Chas. Cory & Son, Inc.

Cutler-Hammer Mfg. Co.

Chas. W. Dahl & Son Elect. Co.

Western Electric Company.

Electrolyzers.

International Oxygen Company.

Engine Distillate.

Standard Oil Company.

Engine Oils.

Standard Oil Company.

Engines, Distillate.

Fairbanks, Morse & Company.

Western Electric Company.

Engines, Gas.

(See Gas Engines.)

Gas Generators.

Chas. W. Dahl & Son Elect. Co.

Engberg's Electric & Mechanical Works.

Mesta Machine Company.

Western Machinery Company.

Engine Lathes.

Berger & Carter Company.

Harron, Rickard & McCone.

Arrives, Gear, Kope.

Atmospheric Company.

Drills (Electric).

Harron, Rickard & McCone.

Marlowe Decking & Supply Co.

Marlowe Decking & Supply Co.

Marlowe Decking & Supply Co.

The U. S. Electrical Tool Co.

Drills, Pneumatic.

Freemason Tool Co.

Drills (Upright and Wall Kadal).

A. C. Latten.

Harron, Rickard & McCone Co.

See Cleveland Punch & Shear Works Company.

Louis G. Hene.

Herberts Machinery & Supply Co.

Fawcett & Harnischfeger Co.

F. O. Stallman Supply Co.

- Louis G. Henes.
 Herberts Machinery & Supply Co.
 Rockford Lathie & Drill Co.
Engines, Oil.
 Busch-Sulzer Bros.' Diesel Engine Company.
 Fairbanks, Morse & Company.
 National Transit Pump & Machine Company.
 New London Ship & Engine Co.
 McIntosh & Seymour Mfg. Corp.
 Pacific Diesel Engine Co.
 Wapakapa.
 Winston Engine Company.
 Western Machinery Company.
 Worthington Pump & Machinery Corporation.
Engineers (Marine).
 Bethlehem Shipbuilding Corporation, Ltd.
 Commercial Iron Works.
 Cox & Stevens.
 D. W. & R. Z. Dickie.
 Federal Shipbuilding Co.
 John Reid & Company.
 Llewellyn Iron Works.
 Mesta Machine Company.
 Moore Shipbuilding Company.
 Morse Dry Dock & Repair Co.
 New York Shipbuilding Co.
 Tebo Yacht Basin Co.
 Tietjen & Lang Dry Dock Co.
 Todd Dry Dock Corporation.
Engineer, Pumping.
 Alberger Pump & Condenser Co.
 De Laval Steam Turbine Co.
 Fairbanks, Morse & Company.
 Griscorn-Russell Co.
 Kerr Turbine Company.
 National Transit Pump & Machine Company.
 Row & Davis, Engineers, Inc.
 Worthington Pump & Machine Corporation.
Engine Revolution Log or Counter.
 The Sperry Gyroscope Co.
Engine Revolution for Direction Indicator.
 The Sperry Gyroscope Co.
Evaporators.
 Ford & Gerding.
 Griscorn-Russell Company.
 Jenkins-Miller Company.
 Ross Heater & Mfg. Co.
 Row & Davis, Engineers, Inc.
Excavators.
 Harron, Rickard & McCone.
 Pawling & Harnischfeger Co.
Expansion Joints.
 Alberger Pump & Condenser Co.
 Crane Company.
 Griscorn-Russell Co.
 Lunkenheimer Company.
 Ross Heater & Mfg. Co.
 C. H. Wheeler Mfg. Co.
 The Wm. Powell Co.
Exporters and Importers.
 Geo. E. Billings.
 A. C. Cullen.
 E. W. McNear, Inc.
 Welch & Company.
Extension Bed Gap Lathes.
 Berker & Carter Company.
 Harron, Rickard & McCone Co.
 Louis G. Henes.
 Herberts Machinery & Supply Co.
 E. K. Wood Lumber Company.
Feed Water Heaters.
 Alberger Pump & Condenser Co.
 Chaslin-Fulton Mfg. Company.
 Ford & Gerding.
 The Griscorn-Russell Company.
 Ross Heater & Mfg. Co.
 Row & Davis, Engineers, Inc.
 Worthington Pump & Machinery Corporation.
Feed Water Regulators.
 Chaslin-Fulton Mfg. Company.
 Foster Engineering Company.
 Keuffel Engineering Co., Inc.
Filters, Aerial.
 Griscorn-Russell Company.
Filters, Feed Water, Oil.
 American Steam Gauge & Valve Mfg. Company.
 Ford & Gerding.
 Griscorn-Russell Company.
 Ross Heater & Mfg. Co.
 Row & Davis, Engineers, Inc.
Fire Alarm Systems (Automatic).
 Chas. Corry & Son, Inc.
Fire Detecting Systems.
 Chas. Corry & Son, Inc.
Fire Extinguishing Systems.
 Chas. Corry & Son, Inc.
Flags and Signals.
 Weeks-Howe-Emerson Company.
Flanges.
 (See also Brazing Flanges)
 American Spiral Pipe Works.
 Crane Company.
 Lunkenheimer Company.
 Floating Drydock Company.
 Lstrand Engineering Company.
 Wm. J. Dooeety.
Floor Gratings.
 Herberts Machinery & Supply Co.
Floor Plates.
 Crane Company.
Fly Wheel (Slow and High Speed).
 Mesta Machine Company.
Forced Draughts.
 DeLaval Steam Turbine Co.
 Keuffel Engineering Company.
 John Reid & Company.
 Westinghouse Electric & Mfg. Company.
Forgings.
 American Manganese Bronze Co.
 Bethlehem Shipbuilding Corp.
 Edwin Forrest Forge Co.
 B. Greedy & Sons Co.
 Hyde Windlass Company.
 Llewellyn Iron Works.
 Marine Decking & Supply Co.
 Mesta Machine Company.
 Morse Dry Dock & Repair Co.
 The Polak Steel Company.
 United Engineering & Foundry Company.
Forging Machines.
 Louis G. Henes.
 Harron, Rickard & McCone.
 Herberts Machinery & Supply Co.
Forging Presses.
 Berker & Carter Company.
 Harron, Rickard & McCone Co.
 Louis G. Henes.
 Crane Machinery & Supply Co.
 Mesta Machine Company.
 Niles-Bement-Pond Company.
 United Engineering & Foundry Company.
Founders.
 Albion Engine & Machine Works.
 American Steel Foundries.
 Bethlehem Shipbuilding Corporation, Ltd.
 Commercial Iron Works.
 Griscorn-Russell Company.
 Llewellyn Iron Works.
 H. G. Trout Company.
Foundry Equipment.
 The Baptist-Blessing Company.
 Harron, Rickard & McCone.
 Harnischfeger Co.
Freight Handling Equipment.
 Brown Hoisting Machinery Co.
 Crane Mfg. Company.
 Louis G. Henes.
 Manning-Maxwell & Moore.
 Shepard Electric Crane & Hoist Co.
Frigidometers.
 McCone Company.
Fuel Economizers.
 Griscorn-Russell Company.
Fuel Oil.
 Com. Company.
 Standard Oil Company.
Fuel Oil Heaters.
 Com. Company.
 Ross Heater & Mfg. Co.
Furnaces.
 American Spiral Pipe Works.
 The Continental Iron Works.
 Electric Furnace Co.
Furnace Bridge Walls.
 Weger Furnace Bridge Wall Co.
Furnace Fronts.
 The Continental Iron Works.
 John Reid & Company.
Furnace Piers.
 Crane Company.
 Griscorn-Russell Company.
 Lunkenheimer Company.
Gages (Pressure, Vacuum, Recording).
 Calhoun Valve Co.
 Star Brass Mfg. Co.
Galley Burners (Oil).
 T. P. Jarvis Mfg. Company.
Gantries, Cranes and Jib Cranes.
 Louis G. Henes.
 Pawling & Harnischfeger Co.
Gas (Acetylene).
 American Gas Engine Company.
Gas-Driven Windlasses.
 Allen Cunningham Co., Inc.
 American Gas Engine Company.
Gas Analyzing Apparatus.
 The Electrolysis Company.
Gas Engines.
 Fairbanks, Morse & Company.
 Harron, Rickard & McCone.
 Marine Supply Co.
 Jacobs, Nel & Twiss Co.
 H. G. Trout Company.
 National Transit Pump & Machine Company.
 Westinghouse Electric & Mfg. Co.
 Weeks-Howe-Emerson Company.
Gas Engine Specialties.
 Crane Company.
 Lunkenheimer Company.
 William Powell Company.
Gas Holders.
 The Electrolysis Company.
Gas Generators (Acetylene, Hydrogen, Oxygen).
 Air Reduction Sales Co.
 The Baptist-Blessing Company.
 David-Bourmouville Company.
 Harron, Rickard & McCone.
 International Oxygen Company.
Gasoline.
 Standard Oil Company.
 Union Oil Company.
Gas Plants, Oxygen and Hydrogen.
 International Oxygen Co.
 The Electrolysis Company.
Gaskets.
 (See Packing).
Gaskets, Iron.
 Smooth-On Manufacturing Co.
Gauges.
 Air Reduction Sales Co.
 American Steam Gauge & Valve Manufacturing Company.
 The Baptist-Blessing Company.
 Crane Machinery & Supply Co.
 International Oxygen Co.
 Lunkenheimer Company.
 Pneumometer Company.
 William Powell Company.
 Star Brass Manufacturing Co.
 Taylor Instrument Companies.
 The Ashton Valve Company.
Gauge Boards.
 American Steam Gauge & Valve Manufacturing Company.
Gauge Cocks.
 American Steam Gauge & Valve Manufacturing Company.
 Lunkenheimer Company.
 The Chapin-Fulton Mfg. Co.
 The Wm. Powell Co.
Gauge Glasses.
 Crane Company.
 Harron, Rickard & McCone.
 Pneumometer Company.
Gauge Testers.
 American Steam Gauge & Valve Manufacturing Company.
Gauges (Differential Pressure, Oxy-Acetylene).
 The Baptist-Blessing Company.
 The Electrolysis Company.
Gears.
 American Steel Foundries.
 DeLaval Steam Turbine Co.
 Johnson Gear Co.
 The Falk Company.
 Kerr Turbine Company.
 Mesta Machine Company.
 Pacific Gear & Tool Company.
 Westinghouse Electric & Manufacturing Co.
Generators.
 (See Electrical Plants).
Generator Sets.
 American Gas Engine & Mechanical Works.
 Ford & Gerding.
 Fairbanks, Morse & Company.
 Keuffel Engineering Co.
 Westinghouse Electric & Manufacturing Company.
Glue.
 Bituminous Products Company.
 L. W. Ferdinand & Company.
Glue (Marine, Canoe and Yacht).
 L. W. Ferdinand & Company.
Governors (Anticipating Marine).
 Chas. Corry & Son, Inc.
Governors (Piston Actuated).
 Excess Boiler Feed Pump.
 Ammonia Pump, Vacuum Pump and Fuel Oil Pump.
 Foster Engineering Company.
Grate Bars.
 Griscorn-Russell Company.
 Keuffel Engineering Co.
Grating (Engine Room).
 Ford & Gerding.
Grease.
 (See Lubricants).
Grease Cups.
 Albion Lubricating Company.
 American Steam Gauge & Valve Mfg. Company.
 Berker & Carter Company.
 Crane Company.
 Griscorn-Russell Company.
 Lunkenheimer Company.
 Second Iron Store Co.
 The Wm. Powell Co.
Grease Extractors.
 Griscorn-Russell Company.
 Row & Davis, Engineers, Inc.
Grease Extracting Feed Water Filter.
 American Steam Gauge & Valve Manufacturing Company.
Grinders (Electric).
 Harron, Rickard & McCone Co.
 Louis G. Henes.
 Berker & Carter Company.
 Harron, Rickard & McCone.
 Herberts Machinery & Supply Co.
Grinding Machines.
 Berker & Carter Company.
 Harron, Rickard & McCone Co.
 Louis G. Henes.
 Herberts Machinery & Supply Co.
 Niles-Bement-Pond Company.
 Second Iron Store Co.
Guns, Line Throwing.
 (See Line Throwing Guns).
Gypsies.
 American Cunningham Co., Inc.
 American Engineering Company.
 Bethlehem Shipbuilding Corporation, Ltd.
 Hyde Windlass Company.
Gun Fire Control Equipment.
 The Sperry Gyroscope Co.
Gyro Compasses.
 Chas. Corry & Son, Inc.
 Sperry Gyroscope Company.
Gyro Roll and Pitch Recorder.
 The Sperry Gyroscope Co.
Gyro Ship Stabilizers.
 The Sperry Gyroscope Co.
Gyroscopes.
 The Sperry Gyroscope Company.
Hack Saws.
 Berker & Carter Company.
 California Machine Company.
 Harron, Rickard & McCone.
Hammers (Drop).
 Louis G. Henes.
Hammers (Steam).
 Berker & Carter Company.
 Harron, Rickard & McCone Co.
 Herberts Machinery & Supply Co.
 Louis G. Henes.
 Niles-Bement-Pond Company.
Hardware and Ship Chandlery.
 Berker & Carter Company.
 Geo. B. Carpenter & Co.
 Ford-Barnes Ship Chandlery Company.
 L. W. Ferdinand & Company.
 Griscorn-Russell Company.
 C. J. Hendry & Company.
 Marine Supply Company.
 Pacific Gear & Tool Company.
 J. & R. Wilson, Inc.
 Steward-Draft & Equipment Corp.
 The Thomas Lumber Co.
 W. J. Tebbott.
 Wm. J. Critchfield & Co.
 Weeks-Howe-Emerson Company.
Hardwoods.
 S. K. Taylor Lumber Co.
Hardware (Marine).
 Columbian Rope Co.
 Durable Wire Rope Co.
 John A. Roebigals Sons Co.
Heaters.
 Alberger Pump & Condenser Co.
 Ford & Gerding.
 Griscorn-Russell Co.
 Harron, Rickard & McCone.
 Jenkins-Miller Company.
 J. L. Mott Iron Works.
 Ross Heater & Mfg. Co.
 Star Iron Works.
Heat Exchangers.
 Griscorn-Russell Company.
Heat Treating.
 Mehr Manufacturing Company.
Hobs (Spiral, Spine Shaft).
 Louis G. Henes.
 Harron, Rickard & McCone.
 Herberts Machinery & Supply Co.
 F. O. Stallman Supply Co.
Hoists.
 (See Chain Hoists, Blocks and Cranes).
 Stamp Electric Hoist Co.

PLEASE MENTION PACIFIC MARINE REVIEW WHEN YOU WRITE

Hoisting Engines.

S. Flye Mfg. Company.
Harron, Rickard & McCone.

Holders-on for Studs.

Kees & Smith Company.

Hose Couplings.

The Huston-Blessing Company.

Hose Nozzles.

A. J. Morse & Son, Inc.

Housings (Iron and Steel).

Mesta Machine Company.

Humidifiers.

Grison-Russell Company.

Hydraulic Supplies.

Crate Company.

Lunkenheimer Company.

William Powell Company.

United Engineering & Foundry Company.**Hydralographs.**

American Steam Gauge & Valve Manufacturing Company.

Hydrogen (Compressors, Generators).

Gas Products Association.

International Oxygen Company.

Hydrogen Cutting.

The Huston-Blessing Company.

Harron, Rickard & McCone.

Hydrogen Gas.

The Huston-Blessing Company.

Hydrogen Testing Apparatus.

Gas Products Association.

Hydrometers.

The Electroba Company.

Hygrometers.

Taylor Instrument Companies.

Ice Detectors.

McNab Company.

Ice Machines.

Brumswick Refrigerating Co.

Ford & Geiringer.

The Frick Company.

T. P. Jarvis Mfg. Co.

H. E. Rootler.

Vulcan Iron Works.

Westinghouse Electric & Manufacturing Company.

Ice Tanks.

Brumswick Refrigerating Co.

Lewellyn Iron Works.

T. P. Jarvis Mfg. Company.

Indicators and Telegraphs.

American Steam Gauge & Valve Manufacturing Company.

Chas. Cory & Son.

Lunkenheimer Company.

McNab Company.

Manning Maxwell & Moore.

Pneumometer Company.

The Thomas Laughlin Co.

William Powell Company.

Indicators, Valve Position.

Chas. Cory & Son, Inc.

Industrial Cars.

American Steel Foundries.

Ingot (Forging).

Lewellyn Iron Works.

Mesta Machine Company.

Southern Calif. Iron & Steel Co.

Ingot (Brass and Copper).

Great Western Smelting & Refining Company.

Seavill Manufacturing Company.

Injectors.

A. C. Callan.

Harron, Rickard & McCone.

Lunkenheimer Company.

Manning Maxwell & Moore.

William Powell Company.

Insulators.

(See Electric Fittings and Supplies.)

Insurance (Marine).

Actus Insurance Company.

Atlantic Mutual Insurance Co.

Firmen's Fund Insurance Co.

Importers & Exporters Inc.

Canton Insurance Office, Ltd.

Frank B. Hall Company.

Phoenix Assurance Company.

Standard Marine Insurance Co.

Union Marine Insurance Co.

Intensifiers.

Mesta Machine Company.

Iron and Steel.

(See Steel and Iron.)

Keying Machines.

Berger & Carter Company.

Harron, Rickard & McCone Co.

Louis G. Henes.

Herbert Machinery & Supply Co.

Lashings.

Steward Davit & Equipment Corp.

Lathe Spindles (Solid and Hollow Bored).

The Pollak Steel Company.

Lathe.

Axelson Machine Company.

A. C. Callan.

Harron, Rickard & McCone Co.

Louis G. Henes.

Herbert Machinery & Supply Co.

Mesta Machine Company.

Niles-Bement-Pond Company.

Rockford Lathe & Drill Co.

F. O. Stallman Supply Co.

Leads, Net and Sounding.

Wilcox, Crittenden & Co.

Life Boats.

American Balsa Co., Inc. Wells

Marine Equipment Dept.

Steward Davit & Equipment Co.

Life Saving Apparatus.

American Balsa Co., Inc. West-

ern Marine Equipment Dept.

Steward Davit & Equipment Co.

Lighting Sets.

(See Electric Plants.)

Line Throwing Guns.

Steward Davit & Equipment Co.

Linoleum.

W. & J. Sloane Company.

Lock Nuts.

Drake Lock-Nut Co.

Locomotive Side and Main Rods.

The Pollak Steel Company.

Locomotive Side and Main Rods, Crank Pins, Axles.

The Pollak Steel Company.

Log Registers.

Cherub Log.

McNab Company.

Thos. Walker & Son, Lt.

Lowering, Carriage and Control (Boat).

Steward Davit & Equipment Corp.

Lubricants.

Allison Lubricase Company.

Standard Oil Company.

Union Oil Company.

Lubricators.

Albany Lubricating Company.

A. C. Callan.

Crate Company.

Grison-Russell Company.

Harron, Rickard & McCone.

Lunkenheimer Company.

Manning Maxwell & Moore.

William Powell Company.

Lubricators (Force Feed).

McCord Manufacturing Co.

Lubricators (Fresh Oil).

Madison-Kipp Lubricator Co.

McCord Manufacturing Co.

Lumber.

(See also Hardwood.)

Geo. E. Billings.

A. C. Callan.

East Atlantic Co., Ltd.

S. K. Taylor Lumber Company.

Van-Ardsde Harris Lumber Co.

Machine Guards.

Harron, Rickard & McCone.

Louis G. Henes.

Page Steel & Wire Company.

Machine Tools.

A. C. Callan.

Crate & Smith Company.

Harron, Rickard & McCone Co.

Herbert Machinery & Supply Co.

Louis G. Henes.

Niles-Bement-Pond Company.

Pawling & Hirschmiller Co.

F. O. Stallman Supply Co.

The Cleveland Punch & Shear Works Company.

Machinery (File).

Louis G. Henes.

Machinery (Gas-Producers).

Air Reduction Sales Co.

Machinery (Special).

F. O. Stallman Supply Co.

Hatfield Machinery Company.

Harron, Rickard & McCone Co.

Louis G. Henes.

Herbert Machinery & Supply Co.

Smith-Booth-Usher Company.

Western Machinery Company.

Malleable Castings.

National Malleable Casting Co.

Malleable Iron Clinch Rings.

See National Malleable Castings

Malleable Iron Cargo Batten Cleats.

The National Malleable Castings Works.

Manganese Bronze Castings.

American Manganese Bronze Co.

Grison-Russell Company.

H. W. Williams Company.

Lunkenheimer Company.

Manholes.

Steward Davit & Equipment Corp.

Marine Engines.

(See also Engines, Oil.)

Bethlehem Shipbuilding Corporation, Ltd.

Theo. A. Crane's Sons Co.

Engel's Electric & Mechanical Works.

Fairbanks, Morse & Company.

Busch-Solter Bros. Diesel Engine Company.

Kerritt Engineering Company.

Kerr Turbine Company.

Lewellyn Iron Works.

Marine Iron Works.

Merchab Shipbuilding Co.

Morse Drydock & Repair Co.

Jas. Shewan & Sons.

Trout & Company.

Western Machinery Company.

Whitburn Pump & Machinery Corporation.

Weeks-Howe-Emerson Co.

Marine Engineers.

(See Engineers and Consulting Engineers.)

Alfon Cunningham Co., Inc.

Marine Insurance.

(See Insurance.)

Marine Power Equipment.

Lewellyn Iron Works.

Schutte & Roering Company.

Marine Railways.

Winlow Marine Ry. Co.

Marine Repairs.

American Shipbuilding Co.

Baltimore Dry Dock & Ship-

building Company.

Bethlehem Shipbuilding Corporation, Ltd.

Commercial Iron Works.

Chas. Cory & Son, Elect. Co.

Theo. A. Crane's Sons Co.

Federal Shipbuilding Co.

Chas. Farnin & Boiler Corp.

Globe Shipbuilding & Dry Dock Company.

Merchants Shipbuilding Corp.

Moore Shipbuilding Company.

Morse Dry Dock & Repair Co.

New York Shipbuilding Co.

Robins Dry Dock & Repair Co.

Shaw & Sons.

Tebo Yacht Basin Company.

Tietjen & Lang Dry Dock Co.

Fodd Dry Dock Corp.

W. & A. Fletcher Company.

Marine Repairs (Electrical).

Chas. Cory & Son, Inc.

Marine Shafting.

Morse Drydock & Repair Co.

The Pollak Steel Company.

Masts and Spars.

Weeks-Howe-Emerson Company.

Mercury Pressure Gauges.

American Steam Gauge & Valve Manufacturing Company.

Mesa Crane Company.

Great Western Smelting Corp.

Metal Cutting Machines.

Harron, Rickard & McCone Co.

Herbert Machinery & Supply Co.

F. O. Stallman Supply Co.

Metal Sawing Machines.

Harron, Rickard & McCone Co.

Louis G. Henes.

Herbert Machinery & Supply Co.

F. O. Stallman Supply Co.

Metallic Packing.

(See Packing.)

Metal Cutting Band Saws and Machines.

The Huston-Blessing Company.

Berger & Carter Company.

Harron, Rickard & McCone Co.

Meters (Oxygen and Hydrogen).

The Electroba Company.

Milling Attachments.

Hatfield Machinery Company.

Harron, Rickard & McCone Co.

Louis G. Henes.

Herbert Machinery & Supply Co.

F. O. Stallman Supply Co.

Milling Machines.

Hatfield Machinery Company.

Harron, Rickard & McCone Co.

Louis G. Henes.

Niles-Bement-Pond Company.

F. O. Stallman Supply Co.

Milling Machines, Plain, Universal, Vertical.

Harron, Rickard & McCone Co.

- Oil Burners.**
Coe Company.
Bethlehem Shipbuilding Corporation, Ltd.
Harron, Rickard & McCone.
T. F. Jarvis Mfg. Company.
Jenkins Miller Company.
White Fuel Oil Eng. Corp.
- Oil Burning Installations.**
Coe Company.
T. F. Jarvis Mfg. Company.
V. S. Jenkins Company.
White Fuel Oil Eng. Corp.
- Oil Burner Control Systems.**
Chas. Cory & Son, Inc.
- Oil Coolers.**
Alberger Pump & Condenser Co.
The Grison-Russell Company.
Ross Heater & Mfg. Company.
- Oil Engines.**
(See Engines, Oil.)
- Oil Fuel.**
Standard Oil Company.
Union Oil Company.
- Oil Fuel Apparatus.**
Coe Company.
White Fuel Oil Eng. Corp.
- Oil Gauges.**
Craze Company.
Lunkenheimer Company.
Pneumator Company, Inc.
Powell Company.
- Oronite Paints.**
Standard Oil Company.
- Oxy-Acetylene Process.**
Air Reduction Sales Co.
The Bastian-Blessing Company.
The Linde Air Products Co.
- Oxy-Acetylene Welding & Cutting Apparatus.**
Air Reduction Sales Co.
The Bastian-Blessing Company.
Barrer & Carter Company.
Davis-Bourneville Company.
Harron, Rickard & McCone.
International Oxygen Co.
Louis G. Henes.
Oxwell Acetylene Co.
Sevold Iron Store Co.
The Electroblabs Company.
- Oxygen.**
Air Reduction Sales Co.
Davis-Bourneville Company.
Gas Products Association.
International Oxygen Co.
Linde Air Products Company.
The Electroblabs Company.
- Oxygen Compressors, Generators.**
Davis-Bourneville Company.
International Oxygen Company.
The Electroblabs Company.
- Oxygen Gas (Electrolytic).**
The Electroblabs Company.
Gas Products Association.
- Packing.**
Belmont Packing & Rubber Co.
Geo. B. Carpenter & Company
Crane Packing Company.
Ford & Gerrie.
Crane Company.
France Packing Co.
Greene-Tweed & Company.
General Abrasive & Rubble Co.
Holmes Metallic Packing Co.
- Oxygen Gas Testing Apparatus.**
The Electroblabs Company.
V. S. Jenkins Company.
Marine Supply Company.
Martell Packing Company.
Morris Drydock & Repair Co.
Plant Rubber & Abrasive Works.
- Paint.**
A. C. Callan.
American Marine Paint Co.
Federal Composition & Paint Company, Ltd.
International Compositions Co.
L. W. Ferdinand Co.
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